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THE PURIFICATION OF WATER SUPPLIES *

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Professor of Bacteriology and Chairman of the Department of Hygiene and Bacteriology, University of Chicago

CHICAGO

Discussion of water purification in this paper is limited to the hygienic aspects of the subject. Clarification of a muddy water, removal of an excess of iron, softening of a hard water are all ends desirable in themselves, but they are not purification in the sense in which that term is here considered. Removal of turbidity may be economically and esthetically important; installation of a municipal water-softening plant may be demanded by considerations of convenience and economy, but softening and clarification of water are never matters primarily concerning public health. If a community desires and can afford to pay for a clear or a soft water, it can get it. The degree of expense in this direction that is justified in comparison with other needs is a question to be determined by each community, bearing in mind that the demands of the modern city are many and urgent, and remembering that in but few instances are funds available to carry out all the measures of improvement that appeal to different groups.

Most citizens would agree in principle if not in practice that the sanitary purity or direct relation of a water supply to health is by far its most important feature. Consideration of purification of water is therefore here restricted to the methods of rendering a contaminated or potentially dangerous supply safe for use.

WHY PURIFICATION IS NECESSARY

The present necessity for water purification in civilized countries is a consequence of two factors: first, the greatly increased demand for water under modern conditions of life; second, the increasing density of population on most parts of the earth's surface. It is becoming more and more difficult to draw for a water supply of any size on a body of surface water that is uncontaminated or at all events not liable to occasional or accidental pollution; as is well known, infectious material discharged by a single human being is sufficient to poison many gallons of water and to cause hundreds of cases of disease. It is difficult also to obtain the volume of water sufficient for a large and rapidly growing community. Many of the smaller towns and villages in the United States rely on deep wells as a source of supply, and from a sanitary point of view such waters are usually excellent. In many regions, however, the amount of available underground water is limited, and if a large amount of water is required by a municipality, surface waters more or less exposed to pollution must be taken. Where surface waters are resorted to, the need for purifying them is so plain in some cases that there can be no question of its imperativeness, as with the Merrimac River, used by the city of Lawrence, Mass., the Hudson River, used by the city of Albany, and the Schuylkill River, drawn on by Philadelphia. In these cities, simple inspection of the water sources is sufficient to show that the river water used as the source of supply is contaminated with fresh sewage, and in an untreated condition is grossly unfit for drinking purposes. Water purification in these cities has been followed by a marked diminution in the amount of certain diseases.

On the other hand, the need for purification of a surface water supply is not always so obviously urgent to the untrained judgment, and detailed observation of disease prevalence and of the bacterial character of a water is necessary before general agreement on the desirability of purification is reached. This has been the water supply history of some cities on the Great Lakes. The city of Cleveland hesitated for several years before undertaking the construction of a filter. Detroit and Buffalo have been rather recently convinced of the desirability of protecting their water supplies by chlorination.

Still other large cities are so fortunately situated in respect to surface water supplies that artificial purification for the time being is not considered necessary. These are practically all in localities where the watershed levied on is owned or controlled by the municipality, and where long storage of impounded waters in natural or artificial reservoirs can be trusted to effect a natural purification. New York and Boston are well-known examples of cities depending on protected and stored surface water.

THE DEVELOPMENT OF WATER PURIFICATION

Public water supplies, although not uncommon in the early history of southern Europe, were practically unknown in Northern Europe in the middle ages, and the large modern water supply systems have been developed for the most part in the last seventy years. Storage of water was undoubtedly practiced in antiquity, but was not consciously resorted to as a means of purification, and the first deliberate attempt at purification of water on a large scale seems to have been less than 100 years ago, when, in 1829, a slow sand filter was built by one of the London water companies. Even in this instance the immediate end in view was clarification of a muddy water

* Read before the Pan-American Scientific Congress, Washington, D. C., Jan. 4, 1916.

and it was not until the connection between drinking water and disease became manifest about twenty years later that the filtration of the whole London water supply was more definitely undertaken as a hygienic measure. Purification of public water supplies became general in England and on the continent of Europe two or three decades earlier than in this country, owing perhaps to the greater density of population in many regions and to the glaring evidences of pollution in many streams serving as water sources. European cities that delayed or boggled water purification often suffered severely from water-borne diseases, as did the wealthy German city of Hamburg in the cholera epidemic of 1892-1893.

In the United States as in Europe, development of public water works has taken place almost wholly since 1850, and the introduction of methods of purification is yet more recent. A beginning in water purification had been made at Poughkeepsie, N. Y., and elsewhere before 1890, but progress has been much more rapid since that date, owing in large part to the impetus given to the study of water purification by the investigations of the state board of health of Massachusetts. These investigations, begun in 1887, were soon followed by the construction of a modern sand filter plant at Lawrence, Mass. (1893), and the striking success of this filter in reducing typhoid fever served as an object lesson to the whole country.

It was calculated by Hazen that in 1900, 6.3 per cent. of the urban population of the country (towns of over 2,500 population) were supplied with filtered water, while in 1911, according to G. A. Johnson, this proportion had arisen to over 20 per cent. Table 1, which I have compiled from the information given in the McGraw Waterworks Directory and from other sources of information, shows the present condition in the larger cities of the United States.

TABLE 1.—CHARACTER OF WATER SUPPLIES IN CITIES OF THE UNITED STATES WITH OVER 10,000 POPULATION IN 1915

Water Supplies	Treated		Untreated		Unknown	
	No. of Cities	Population	No. of Cities	Population	No. of Cities	Population
Wells and springs	28	2,491,810	76	2,215,163	63	1,765,559
Rivers and streams	141	10,769,547	22	1,053,418	25	603,423
Impounding reservoirs	30	1,992,035	19	5,269,524	19	842,526
Lakes	38	5,493,206	25	1,886,312	16	464,690
Wells and rivers	15	571,566	5	92,301	7	452,812
Source not known					32	516,273
Totals	252	21,318,164	147	10,516,718	162	4,645,283

It will be noted that while over 60 per cent. of the total city population of the United States is at present supplied with water treated by some method of purification, the actual proportion of the population supplied with hygienically safe water is far greater. The water from deep wells and from storage reservoirs is unquestionably in large part of excellent quality even if not subjected to artificial purification. It is fair to assume that 30,000,000 out of the 36,500,000 people living in cities with over 10,000 population are now provided with water initially pure or more or less effectively purified. Taking into consideration smaller towns and villages, it seems likely that at least 50 per cent. of the total population of the United States is today supplied with water of a high degree of purity.

Hazen estimated that in 1904 water of a more or less unsatisfactory quality was supplied to approximately 52 per cent. of the urban population of the United States in cities of more than 25,000 inhabitants; at present, 1915, this statement, as far as sanitary quality is concerned, would hardly hold true for more than 20 per cent.

MODERN METHODS OF PURIFICATION

(*a*) *Storage.*—A high degree of natural purification of water can be effected by storage. When the water of small streams is impounded in a reservoir instead of being pumped directly into water mains, important changes occur. Suspended matter in part sinks to the bottom and the water becomes clearer, the color of the water is usually lessened owing to bleaching by the sunlight, and the total number of bacteria in the water is materially diminished. Most important of all, any disease-producing bacteria that may have found their way into the tributary streams tend to perish during the sojourn of the water in the reservoir. A cardinal factor in bringing about the death of pathogenic bacteria in water is time. So far as is known, disease germs introduced into water never multiply under natural conditions, but progressively and rather rapidly die off. The longer a water can be stored, therefore, either in an artificial reservoir or in a natural lake or pond with protected shores, the less liable it is to harbor disease germs. This principle of storage, based on the high mortality of typhoid bacilli and allied bacteria suspended in water, is being utilized in the treatment of many large surface water supplies apparently with high success. New York and Boston, as already mentioned, are relying mainly on this method to insure the purity of their supplies. The safety of the London supply is thought to depend very largely on storage. Adequate storage is often all that is needed. In cities where other methods of purification are employed, preliminary storage is highly advantageous since it reduces the burden on filters, and in other ways facilitates the application of special purifying treatment.

(*b*) *Slow Sand Filters.*—The use of beds of sand carefully superimposed on gravel in water-tight basins was probably the first method employed for water purification (London, 1829) on a large scale. The water is passed continuously on the sand, and flows through by gravity. The earlier European filtration plants were all of this type. In this country slow sand filters have been installed at Albany, N. Y., Pittsburgh, Washington, D. C., Philadelphia and other cities. Through such filters water may be commonly passed at a rate of 3,000,000 gallons daily per acre of filtering surface, and if the water treated is not very turbid or badly polluted, a rate of 6,000,000 gallons or more daily may be permissible. It is important that the speed at which the water passes through the sand shall not vary suddenly or in different parts of the filter, and ingenious devices for regulating the flow are in use in order to maintain a uniform rate of filtration. Disturbance of the filtering surface by ice also impairs the efficiency of the operation, and in some instances has been followed by outbreaks of disease.

One of the principal elements of expense in the operation of slow sand filters is the necessity for removing and eventually cleaning and replacing the thin upper layer of sand which becomes clogged in operation. The frequency with which the sand surface must be scraped and renewed depends largely on the amount of suspended matter in the water treated and on the rate of

operation. The use of ample preliminary settling basins or storage reservoirs will lessen the operating cost, as well as introduce an element of safety. Taking into consideration the interest on the capital invested in construction and other proper capital charges, together with the cost of maintenance, the average cost of purifying water by slow sand filters is about $8 per million gallons under present conditions in this country. On the basis of a daily per capita water consumption of 125 gallons, this involves an annual cost of about 36 cents per capita.

(*c*) *Rapid Sand Filtration.*—Slow sand filters are not adapted for use in many parts of the United States because the amount and fineness of the suspended matter in many American rivers leads to premature clogging of the sand and a total obstruction of operation. A somewhat different type of filter known as the mechanical or rapid filter has proved to have marked advantages in dealing with very muddy water, such as is found in the Ohio and Mississippi rivers. If a turbid water is first treated with some coagulating chemical, such as aluminum sulphate or iron sulphate, it can be passed through sand at a much higher rate than is possible with the untreated water. The development of rapid filtration with the use of a coagulant has been largely a matter of American invention, and in its beginning depended to a great extent on the use of patented processes and mechanical devices protected by patent. The expiration of some of these patents has opened the road for a wider application of this method, and has been followed by important developments. Experiments at Louisville and Cincinnati have established the applicability of the coagulating process to large volumes of water, and at present rapid sand filters are in operation at Cincinnati, Minneapolis, St. Louis and many smaller cities. Suitable automatic devices for controlling the application of the coagulating chemical are indispensable, since any material excess or deficiency of the coagulant is fatal to successful or economical operation. Many of the earlier installations of rapid filters by private firms were not properly supervised, and in some cases the original plant was improperly constructed or allowed to deteriorate so that the whole process for a time fell into a measure of disrepute.

The cost of construction of rapid sand filters is much less than that of slow sand filters, but the cost of operation is greater. Reckoning all charges, the total cost per million gallons of water purified averages distinctly less (about $6 per million gallons) by the rapid than by the slow process.

(*d*) *Germicidal Treatment.*—Although in the course of years a great variety of chemical substances have been proposed for the disinfection or partial sterilization of water supplies, only a few of these have won any extended practical application. The use of *ozone* for water sterilization possesses certain theoretical advantages. Several small plants using ozone have been operated in European countries, but in practice the relatively high expense of generating the ozone and bringing it into intimate contact with the water to be treated has so far proved an obstacle to the utilization of this mode of treatment for large supplies. It is possible that the availability of cheap electric power for generating ozone, combined with other favorable factors, may under some conditions render ozonization desirable. The development of cheaper germicidal processes, however, has checked, perhaps permanently, the general introduction of ozonization.

The objection of high cost obtains also with respect to the use of *ultraviolet rays.* These rays, which are conveniently generated by specially constructed lamps, have a high germicidal power, and quickly destroy bacteria in clear water. Experimentally ultraviolet sterilization has very desirable qualities, but thus far, owing to the expense of operation and to the necessity for a preliminary clarification of very turbid waters, it has not been used in this country for large scale installations.

The use of *calcium hypochlorite* ("chloride of lime," or "bleaching powder") has for some years past quite overshadowed other methods of germicidal treatment. Variations in the character of the water and in the composition of the commercial bleaching powder affect the amount that it is necessary to add to secure germicidal efficiency, but in general the quantity of the powder used ranges from about 5 to 15 pounds for each million gallons of water treated. The cost of bleaching powder under normal conditions has been less than 2 cents a pound. Since the opening of the war, the cost has been greatly increased. Including the expense of application, hypochlorite treatment costs not more than one tenth as much as filtration. The action of the hypochlorite is similar to that of ozone, and depends on the strongly oxidizing powers of the hypochlorous acid that is formed when the bleaching powder is added to water. The advantages of the hypochlorite treatment are the cheapness, harmlessness, ease and speed with which it may be employed. The chief objection is the liability to the production of disagreeable tastes or odors which its use entails. Chlorin gas itself has a distinctly unpleasant odor even in small quantities, and the action of the hypochlorite on certain organic matters present in water also generates disagreeable tastes and smells. Complaints on this score in communities in which hypochlorite treatment of the water is practiced are especially common in cold weather. Waters differ in respect to their tendency to develop objectionable odors, and in practical operation some waters are very troublesome. An important improvement in the field of water disinfection has been the substitution of liquefied chlorin gas ("liquid chlorin") for calcium hypochlorite. The gas, which is generated by the electrolysis of brine, is dried, cooled and compressed, and is then marketed in liquid form in portable cylinders under pressure. The advantages claimed for the use of the gas include superior economy and simplicity in regulation. Liability to cause unpleasant odors is said to be much less by this mode of treatment. Overdosing, however, may occur both with liquid chlorin and bleaching powder.

RESULTS OF WATER PURIFICATION

When a polluted water that serves as a source of municipal supply is treated by slow sand filtration, the most conspicuous immediate change in the health of the community is a drop in the typhoid death rate. This has been demonstrated repeatedly in European cities, as in Hamburg, for example, and in many American cities. In Lawrence, Albany, Pittsburgh and Philadelphia, slow sand filtration of a highly polluted river water has been followed by a reduction in the reported typhoid mortality to one third or even one fourth of that formerly prevailing. A decrease in water-caused infant mortality has also been noted;[1] it is yet unknown to what extent the connection

1. McLaughlin: Pub. Health Rep., 1912, No. 77.

between infant mortality and sewage-polluted water supplies is due to infection with the typhoid bacillus. In some instances, though not in all, the so-called Mills-Reincke phenomenon has been observed, namely, a decline in the general death rate minus the typhoid component, and in the reported deaths from certain other diseases, such as tuberculosis and pneumonia, not commonly regarded as water-borne.[2]

There is no doubt that some deaths from typhoid infection both in infants and adults have been and still are reported under some other designation. I have elsewhere[3] called attention to the decrease in reported deaths from "malaria" in Albany, N. Y., following the installation of a sand filter. It is unquestionably true that in other cities some of the deaths in the past reported as due to "malaria" or "typhomalaria" should have been properly classed with those from typhoid fever. Mistaken diagnosis may explain to some degree such decline in general death rates as cannot be referred directly to the diminution in deaths specifically attributed to typhoid fever. Thus, in St. Louis (Table 2) a correspondence can be noted in some years between the number of reported deaths from typhoid fever and the reported deaths from "malarial fever." In more northern cities, in which, for various reasons, the diagnosis of death from "malaria" is less likely to be made, the same correspondence can yet be noticed under certain conditions (Table 3). There seems no escape from the conclusion that at least some—probably a large proportion—of the deaths recorded as due to "malarial fever" in these cities were in reality caused by typhoid infection.

It has further been shown by Dublin,[4] from a study of insurance records, that the normal expected mortality is doubled among typhoid convalescents during the first two years after their recovery from the disease. In his statistics, tuberculosis, diseases of the heart and kidneys, and pneumonia were prominent among the causes of death in a limited number of typhoid patients subsequent to recovery. If this conclusion proves generally valid, there must always be expected some lessening of the general mortality in addition to that due to the typhoid component, and perhaps in some cases a measurable diminution in the

TABLE 2.—DEATHS REPORTED IN ST. LOUIS

Year	Typhoid Fever	Malarial Fever
1890	140	226
1891	165	216
1892	441	326
1893	215	284
1894	171	179

death rate from tuberculosis and other diseases accompanying a decrease in typhoid fever due to water purification. In a word, certain individuals appear to be so affected by the typhoid infection that although surviving for a time, they die within two years from tuberculosis or cardiac lesions. To what extent the Mills-Reincke phenomenon and Hazen's theorem are explicable on this basis is matter for further investigation to determine.

Granting that many deaths from typhoid fever and its sequelae are prevented by slow sand filtration, the question may be raised as to what degree of safety is attained by this method, whether absolute or limited. The necessity of care in operation is well known. Bacterial and other observations clearly show that dangerous bacteria may pass through the sand, if there is any "accident" to the filter or any "disturbance" of its normal action. The epidemics of cholera at Altona, Germany, and typhoid fever at Lawrence, Mass., illustrate the way in which the formation of ice can interfere with the safe operation of a filter.

While the harm from such unusual interruption of normal filter action is sufficiently demonstrated, it is not so easy to measure the degree of danger existing under more ordinary conditions. Reliance on bac-

TABLE 3.—DEATHS REPORTED IN CHICAGO, 1891

Month	Typhoid Fever	Malaria
January	67	7
February	61	9
March	71	16
April	130	18
May	408	22
June	167	7

terial averages of effluents may be misplaced, since a low average may be reached even if occasional breaks occur in a long series of low numbers. Should typhoid bacilli pass through a filter during one hour in twenty-four or for one day in the year, absolute protection is plainly not afforded. While the data for a final judgment on this point do not exist, it must be admitted that there is some evidence that the attempts to treat a highly polluted raw water place at times too great a burden on the filter. Intestinal bacteria of the *Bacillus coli* type may appear in the effluent in such cases in numbers thought by some observers to indicate danger.[5]

Among the recent attempts to establish standards for safe drinking water may be noted the report of the commission appointed by the U. S. Treasury Department to consider standards for water supplied to the public by common carriers engaged in interstate commerce.[6] The commission reported as follows: "1. The total number of bacteria developing on standard agar plates incubated twenty-four hours at 37 C. shall not exceed 100 per cubic centimeter. . . . 2. Not more than one out of five 10 cubic centimeter portions of any sample examined shall show the presence of organisms of the *B. coli* group. . . ." A study of the records of filtration plants shows that in some instances the application of such a standard would lead at times to the condemnation of filter effluents. It has been suggested that the standard proposed is too severe for general municipal water supplies,[7] and perhaps this is a just criticism; but in any case it is clear that the margin of safety in some filtration plants is not very great.

The results of rapid or mechanical filtration are essentially similar to those of slow sand filtration. The percentage of bacterial removal reaches practically the same height as in the slow sand filter, and a marked decline in typhoid fever has been observed in many cities following the introduction of rapid filters. In Cincinnati, Columbus, Ohio, Paterson, N. J., and other cities, the typhoid death rate has sunk to low figures after rapid filters were installed. The necessity for careful and unremitting supervision of operation is

2. Sedgwick and MacNutt: Jour. Infect. Dis., 1910, vii, 489.
3. Jordan, E. O.: Tr. Am. Soc. Civil Engineers, Inter. Eng. Congress, 1905, liv, D, p. 206.
4. Dublin: Am. Jour. Pub. Health, 1915, N. S., v, 20.
5. McLaughlin: Pub. Health Rep., Jan. 26, 1914.
6. Bacteriological Standard for Drinking Water, Reprint 232, U. S. Pub. Health Rep., 1914.
7. Fuller: Jour. Franklin Institute, July, 1915, p. 42.

quite as great in the case of rapid filters as with those of the slow sand type. The safety of the mechanical filter effluent is no more certain or absolute than that of slow sand filters.

Excellent results as regards bacterial efficiency and security from typhoid infection are achieved by bleaching powder and by liquid chlorin treatment. The chief difficulty experienced in this mode of water purification lies in the close approximation for many waters

TABLE 4.—DEATHS FROM TYPHOID PER HUNDRED THOUSAND POPULATION, MILWAUKEE, WIS.*

Year	Death Rate	Remarks
1906-1910 (average)	27	
1911	19	Hypochlorite used intermittently
1912	25	Hypochlorite used continuously after September, 1912
1913	11	Hypochlorite used continuously after September, 1912
1914	8	Hypochlorite used continuously after September, 1912
1915	5†	Liquid chlorin treatment begun March 31, 1915

*From information kindly furnished me by Dr. G. C. Ruhland, health commissioner, Milwaukee.
† Estimated.

of the limit of germicidal efficiency and the limit of inoffensiveness. If unpleasant odors are produced by the chemical, the maintenance of an adequate bactericidal strength often proves difficult in the face of complaints from hundreds of water consumers. The city of Cleveland is thought to have suffered excessively from typhoid in 1913 in consequence of a decrease in the dosage of hypochlorite.[8] Temporary cessation of the hypochlorite, or reduction to an amount inadequately germicidal, may sometimes be followed by a definite typhoid epidemic, as in the outbreak which I investigated at Quincy, Ill., in 1913.[9]

A remarkable reduction of typhoid has been observed in some cases to accompany the hypochlorite treatment. The experience of Milwaukee is in point.

Other similar instances are on record in which a marked typhoid decrease has been chiefly attributable to chlorin treatment of the public water supply. In such cases it is interesting to note that although clarification is not effected by the chlorin treatment, the

TABLE 5.—METHODS OF WATER PURIFICATION IN CITIES OF THE UNITED STATES WITH OVER 10,000 POPULATION

	Number of Cities	Population
Slow sand filtration:		
With chlorin	13	2,886,223
Without chlorin	19	1,073,290
Rapid sand filtration:		
With chlorin	105	7,343,987
Without chlorin	46	3,825,980
Chlorin treatment alone	57	5,793,419

sanitary success seems at least as great as when filtration is practiced.

One noteworthy development of the chlorin treatment (hypochlorite or liquid chlorin) has been its application either to the raw water or to the effluents of slow sand and rapid filters. Hypochlorite dosage of the water applied to filters or of the filter effluents has, in fact, become an almost universal procedure (Table 5). It does not yet appear that this practice is accompanied by any measurable decline in typhoid fever in cities previously served by a modern well-operated filter.

THE OUTLOOK

A few probable developments in water purification in the United States can be forecast. It seems likely that the public demand for a clear, as well as a purified water will increase, and that sand filtration of the mechanical type will become more general. It is also probable that the increase in pollution of surface waters consequent on growing density of population will tend to overburden filter plants, and that if the raw water cannot be protected, chlorination will be generally resorted to as an adjunct to filtration. In the near future practically all surface waters not adequately purified by protected storage will be treated by some purifying process. Already approximately 80 per cent. of the population of cities of over 10,000 inhabitants and over 50 per cent. of the total population of the country are supplied with purified surface water, or from ground water sources of excellent sanitary quality. At the present rate of progress, water-borne disease in the cities and larger towns of this country will be relatively rare within ten years.[10]

8. Collins and Perkins: Cleveland Med. Jour., 1914, xiii, 786.
9. Jordan, E. O.: Jour. Infect. Dis., 1913, xiii, 16.
10. Typhoid in the Large Cities of the United States in 1914, special article, THE JOURNAL A. M. A., April 17, 1915, p. 1322.

PELLAGRA: CAUSATION AND A METHOD OF PREVENTION

A SUMMARY OF SOME OF THE RECENT STUDIES OF THE UNITED STATES PUBLIC HEALTH SERVICE

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One of the outstanding features of the epidemiology of pellagra is the striking relation of the disease to poverty. In reflecting on this and in considering the elements that differentiate poverty from affluence, diet, in view of the conspicuous place it has always had in discussions of the disease, naturally arrested attention. Approaching the problem of the possible relation of diet to pellagra in this way, it seemed permissible to assume, on the one hand, that the diet of the poor, that is, of those who as a class are the principal sufferers from the disease, is, for some reason, pellagra-producing, and, on the other, that the diet of the well-to-do, who, as a class, are practically exempt, is, for some reason, pellagra-preventing. The thought was near, therefore, that it might be possible to prevent the disease by providing those subject to pellagra with a diet such as that enjoyed by well-to-do people. Early in 1914, it was proposed to put this idea to a practical test.

Before the test was actually begun, studies of the prevalence of pellagra at institutions, such as prisons, asylums and orphanages, were made, the results of which, in the light of the recent advances in our knowledge of beriberi, very strongly suggested the idea that the disease was dependent on a diet that was, for some reason, faulty, and that this fault was in some way either prevented or corrected by including in the diet suitable proportions of the fresh animal protein foods

and legumes.[1] These findings not only confirmed the original conception, but also helped in defining this more clearly, and, moreover, made it possible to formulate more definite plans, which were temporarily broadened to include a test of diet in the treatment as well as in the prevention of the disease.

TREATMENT

At my suggestion, Dr. W. F. Lorenz,[2] who was at that time studying the psychiatric manifestations of pellagra at the Georgia State Sanitarium, treated a series of twenty-seven cases in the insane at that asylum exclusively by diet. Considering the character of the cases with which he was dealing, his results, as well as those of Dr. D. G. Willets,[3] who for a time continued the work begun by Lorenz, were notably favorable.

When the various recent methods of treatment, each warmly advocated by its author, are critically reviewed in the light of the test made by Lorenz and by Willets, one can hardly fail to be impressed by the fact that the one thing they all appear to have in common is the so-called "nutritious" diet, and it is difficult to escape the conclusion that it is to this single common factor that the marked success that is usually claimed for the "treatment" should properly be assigned.

It is of much interest to note that fully fifty years ago Roussel,[4] on the basis of long experience and from a critical review of the literature of his day, came to precisely the same conclusion. This is so much to the point that it is quoted herewith:

> Without dietetic measures *all remedies* fail. . . . When drugs and good food are simultaneously employed it is to the latter that the curative action belongs; the former exercises simply an adjuvant action and is without proved efficacy except against secondary changes or accidental complications.[5]

Hereafter the clinician who would attribute therapeutic value to any drug or other remedy in the treatment of pellagra should be prepared to show, what has not heretofore been done, that the curative effect claimed cannot be attributed to the diet. It is true that the claim is not infrequently made that the beneficial effects of the remedy advocated were obtained without any change in diet. When this claim is critically considered, however, it amounts usually simply to this, that the observer gave no instructions as to a change in the patient's diet, or assumes that such change as was made was too slight to merit consideration. It should not be overlooked that the symptoms of the disease (sore mouth, diarrhea) are very frequently such that the patient, entirely on his own initiative, may or does add or increase the proportion of the liquids (milk, eggs, broth) in his diet. And this may be done even before the physician is consulted.

Again, in order to substantiate the claims made for some particular remedy, it is sometimes asserted that the patient's diet had all along included an abundance of the animal proteins and legumes. Careful inquiry in a number of such instances has almost invariably shown that what is meant in such cases is that either the family table was known, or was assumed to be well supplied with these foods of which the patient was, perhaps quite naturally, assumed to have partaken abundantly. The important possibility that the patient, by reason of a personal idiosyncrasy or otherwise did not actually eat these foods is almost invariably overlooked. That these foods may, in some degree, enter into the pellagrogenous dietary calls, however, for no denial. The question always to be borne in mind is: Was it enough? The possibility, if not the probability, of a "twilight" zone within which a very slight change in any of the dietary components may cause an important shift of balance is not to be overlooked. In the present state of our knowledge, therefore, the question of a sufficient proportion cannot in all instances be answered on the simple statement of the case. That as a matter of fact the proportion of the foods in question in these, which may be called borderland cases, was not enough is very strongly suggested by the favorable result of the simple expedient of having the patient continue the diet on which he is supposed to have subsisted, seeing to it, however, that there is actually consumed an abundance of the animal foods and legumes. This and the unsatisfactory progress of those patients who for one reason or another fail or refuse to cooperate in taking the diet is decidedly illuminating.

Such observations as I have been able to make strongly suggest that real recovery from an uncomplicated attack may not take place until after a minimum of about three or four months of full feeding of fresh animal proteins and legumes. But this should not be taken to mean that thereafter recurrences are impossible. A "recurrence," so-called, may conceivably take place after the lapse of any interval if there is a return for a sufficiently long period to a pellagrogenous, that is, "faulty" diet. In pellagra, as in other conditions, the renewed operation of the essential causative factor may be expected to bring about a renewed manifestation of its effects.

1. Prof. Carl Voegtlin tells me that at about the same time, or even previous to this time, he had independently formed somewhat similar views, which he presented at the 1914 session of the American Medical Association (The Journal A. M. A., Sept. 26, 1914, p. 1094). The following quotations from this paper will give the student of the subject the essentials of Voegtlin's conception:

> "From a survey of the clinical and pathologic aspects of pellagra, I have arrived at the conclusion that we are dealing with a chronic intoxication. While the agents at work in this intoxication are as yet unknown, I am inclined to believe that toxic substances exist in certain vegetable foods, not necessarily spoiled, which, if consumed by man over a long period of time, may produce an injurious effect on certain organs of the body. This hypothesis does not rule out the possibility that a dietary deficiency . . . [vitamin] . . . may play a rôle in the production and treatment of pellagra. Extensive feeding experiments which I have carried on during the last year with animals, such as mice, rats and a few monkeys, on an exclusive vegetable diet, have shown that these lower animals develop certain gastro-intestinal symptoms, and sometimes die if put on an exclusive diet of corn, carrots, sweet potatoes, oats, etc. Symptoms arise, often within three or four days, which point to the presence of an intoxication in these animals. Death resulted in some cases in a remarkably short time (three or four days). At necropsy constant lesions were found, such as hyperemia and hemorrhage in the gastro-intestinal canal. Sometimes the kidneys, lungs and other organs show a congestion and slightly hemorrhagic condition. . . ."
>
> "It is probably more than a mere coincidence that the population of that part of the world in which pellagra is endemic lives on a mainly vegetable diet."
>
> "The recent advances in the field of nutrition suggest new avenues of approach to the solution of this difficult problem. One will have to consider very seriously:
>
> "1. A deficiency or absence of certain vitamins in the diet.
>
> "2. The toxic effect of some substances, as aluminum, which occur in certain vegetable food."
>
> "[The possible relation between aluminum and pellagra was also discussed in a recent monograph by Alessandrini and Scala (Contributo nuovo alla etiologia e pathogenesi della Pellagra, Roma, 1914) which I received at the time of proofreading. These investigators claim that colloidal silica contained in drinking water is one of the most important etiologic factors, inasmuch as they succeeded in producing lesions resembling pellagra in animals fed on water containing colloidal silica. Colloidal aluminum hydroxid or a mixture of colloidal silica and alumina produced the same results. In view of the fact, first discovered by us, that aluminum occurs in certain vegetable food in relatively large amounts, the work of the Italian authors furnishes additional evidence that aluminum occupies a prominent position in the etiology of pellagra.]"
>
> "3. A deficiency of the diet in certain amino-acids."

2. Lorenz, W. F.: The Treatment of Pellagra, Pub. Health Rep., Sept. 11, 1914.

3. Willets, D. G.: The Treatment of Pellagra by Diet, South. Med. Jour., 1915, viii, 1044.

4. Roussel, Théophile: Traité de la pellagra et des pseudo-pellagres, Paris, 1866, p. 529.

5. The italics are Roussel's.

PREVENTION

In planning the test of the preventive value of diet, it was decided to take advantage of the universally recognized fact that "normally" pellagra tends to recur in the individual from year to year.

In order to obtain as significant and decisive results as possible, it was necessary to submit a large number of pellagrins to the test under known conditions. Fortunately, two orphanages were found in May, 1914, each having a high incidence of pellagra among its inmates. Later this preventive test was extended to include two groups of insane at the Georgia State Sanitarium.

In the study at the orphanages, Assistant Surgeon C. H. Waring was associated with me, and in that at the Georgia State Sanitarium, Assistant Epidemiologist D. G. Willets.

Orphanage Study.—The two orphanages at which the value of diet in the prevention of pellagra has been tested are located in Jackson, Miss. At both, cases of pellagra have been recognized for several years. During the spring and summer of 1914, up to September 15, a total of 209 cases of pellagra were observed in the children of these orphanages. Although a number of these at both institutions were known to be admission cases, others appeared to have developed first after considerable periods of residence, while a large proportion were in long time residents. The factor or factors causing pellagra and favoring its recurrence seemed, therefore, to be operative at both institutions.

At both places hygienic and sanitary conditions left much to be desired. Both were overcrowded. Each drew and has continued to draw its drinking water from the public supply. One has a water carriage sewerage system connected with that of the city; the other is provided only with unscreened privies. At the latter a great deal of soil pollution was noted.

Before beginning the test it was requested that no change be made in hygienic and sanitary conditions; this request, it is believed, has been fully complied with.

Since about the middle of September, 1914, the diet at both orphanages has in certain respects been supplemented by the Public Health Service. At both institutions a very decided increase was made in the proportion of the fresh animal and of the leguminous protein foods. The milk supply was greatly increased. The children between 6 and 12 years of age were provided with a cup of about 7 ounces of milk at least twice a day. Those under 6 had it three times a day. Until the spring of 1915, the milk used was all fresh sweet milk. In April of that year, buttermilk was added to the diet; this was served at first only on alternate days to those over 12 years of age; later it was served to all at the midday meal. Eggs, which had not previously entered into the regular diet of these children, were served those under 12 years of age at the morning meal. It had been the custom to serve fresh meat but once a week; this was increased to three or four times a week.

Beans and peas, which had been conspicuous in the diet only during the summer and fall, were made an important part of nearly every midday meal at all seasons. No canned foods other than tomatoes were allowed, in order to eliminate the possibly injurious action on the foods of the high temperatures to which they are necessarily subjected in the process.

The carbohydrate component of the institution diets was modified with the object of reducing the proportion of this element. In this connection it may be noted that though the corn component was much reduced, it was not wholly excluded. Corn bread was allowed all children once a week, and grits once or twice a week in addition to those over 12 years of age.

Of the 209 cases of pellagra observed at the two orphanages during the spring and summer of 1914, up to September 15, not less than 172 completed at least the anniversary date of their attack under observation. In only one of these 172 pellagrins, following the change of diet, was there recognized, during the year 1915, evidence justifying a diagnosis of a recurrence, although on the basis of Rice's[6] experience at an orphanage in Columbia, S. C., there might reasonably have been expected from 58 to 76 per cent., or from ninety-nine to 130 of them to recur. Furthermore, there was observed no new case in any of the nonpellagrin residents, 168 of whom were continuously under observation for at least one year. Recent admissions aside, during 1915 there has been no pellagra at one, and but a single case at the other of these institutions.

Asylum Study.—Through the courtesy and with the very helpful cooperation of the officers and staff of the Georgia State Sanitarium, two wards of pellagrins, one in the colored and the other in the white female service, were made available for the test.

Large numbers of cases of pellagra are observed annually at this institution, the largest in the South. A large proportion of these are admission cases, but cases of intramural origin are of frequent occurrence. This asylum must, therefore, be regarded as an endemic focus of the disease.

The wards were organized for this test late in the fall of 1914. In selecting the patients only one condition was observed, namely, that the patient should be of such type as would give reasonable degree of probability of remaining under observation for at least a year. In consequence, a considerable proportion were of a much deteriorated, untidy class.

The diet furnished the inmates of these two wards was, as at the orphanages, supplemented by the Public Health Service, and modified so as to increase decidedly the proportion of the animal and leguminous protein elements. A cup of about 7 ounces of sweet milk is furnished each patient for breakfast and one of buttermilk at both dinner and supper. Fully half a pound of fresh beef and 2 to 2½ ounces of dried field peas or dried beans enter the daily ration. In order to favor the consumption of milk, oatmeal has almost entirely replaced grits as the breakfast cereal. With a view of reducing the carbohydrate component, syrup has been entirely excluded. Corn products, although greatly reduced, have not been entirely eliminated. The menu that follows will serve to give a more detailed idea of the character of the diet furnished.

WEEKLY MENU

MONDAY

Breakfast.—Grits, sweet milk, sugar, broiled steak, hot rolls, biscuits, coffee.

Dinner.—Roast beef, gravy, peas, potatoes, rice, biscuits, buttermilk.

Supper.—Stewed apples, light bread, coffee, buttermilk, sugar.

6. Rice, quoted by Goldberger, Joseph; Waring, C. H., and Willets, D. C.: The Prevention of Pellagra, Pub. Health Rep., Oct. 22, 1915, p. 3117.

TUESDAY

Breakfast.—Oatmeal, sweet milk, sugar, Hamburger steak, biscuits, hot rolls, coffee.
Dinner.—Beef stew, potatoes, rice, bread, buttermilk.
Supper.—Baked beans, light bread, coffee, sugar, buttermilk.

WEDNESDAY

Breakfast.—Oatmeal, sweet milk, sugar, beef hash, hot rolls, biscuits, coffee.
Dinner.—Pea soup, corn bread, gravy, potatoes, rice, bread, buttermilk.
Supper.—Stewed prunes, light bread, coffee, sugar, buttermilk.

THURSDAY

Breakfast.—Oatmeal, sweet milk, sugar, fried steak, hot rolls, biscuits, coffee.
Dinner.—Beef stew, peas, potatoes, rice, bread, buttermilk.
Supper.—Baked beans, bread, coffee, sugar, buttermilk.

FRIDAY

Breakfast.—Oatmeal, sweet milk, sugar, broiled beef steak, hot rolls, biscuits, coffee.
Dinner.—Pea soup (purée), roast beef, potatoes, rice, bread, buttermilk.
Supper.—Light bread, coffee, sugar, buttermilk, apples, baked beans.

SATURDAY

Breakfast.—Oatmeal, sweet milk, sugar, Hamburger steak, hot rolls, biscuits, coffee.
Dinner.—Beef stew, potatoes, rice, bread, buttermilk.
Supper.—Bread, baked beans, buttermilk, coffee, sugar.

SUNDAY

Breakfast.—Oatmeal, sweet milk, sugar, mackerel, bread, coffee.
Dinner.—Loaf beef and gravy, peas, potatoes, rice, bread, buttermilk, pudding.
Supper.—Beef hash, bread, sugar, coffee, buttermilk.

NOTE.—Green vegetables in season at irregular intervals. Milk and eggs, as a special diet, are furnished those patients who may require them.

Aside from the modification in the diet and the increased watchfulness over the individual feeding, enjoined on the nurses and attendants, no change in the habitual routine of the corresponding services was made.

Of the pellagrins admitted to these wards at the time of their organization, or shortly thereafter—that is, up to Dec. 31, 1914—seventy-two (thirty-six colored and thirty-six white) remained continuously under observation up to Oct. 1, 1915, or, at least, until after the anniversary date of their attack of 1914. Of the colored patients, eight have histories of at least two annual attacks; of the white patients, ten have histories of at least two attacks. Nevertheless not a single one of this group of seventy-two patients has presented recognizable evidence of a recurrence of pellagra, although of a group of thirty-two control pellagrins (seventeen colored and fifteen white) not receiving the modified diet, fifteen (nine colored, six white), or 47 per cent., have had recurrences during the corresponding period.

Significance.—Considering the foregoing results as a whole, bearing in mind that three different institutions are involved, each institution an endemic focus of the disease, and bearing in mind also that the number of individuals is fairly large, it would seem that the conclusion is justified that the pellagra recurrence may be prevented and, in view of the conditions of the experiment, that it may be prevented without the intervention of any other factor than diet. In this connection the question arises whether it is permissible to extend this conclusion to the primary attack, apart from its recurrence. The character of the answer to this question will depend on the view held as to the nature of the pellagra recurrence.

Among the epidemiologic features of pellagra, none is more striking than the tendency for the disease not only to develop in spring or early summer, but also to recur year after year at about the same season. Various explanations of this singular phenomenon have been advanced. According to Sambon,[7] "this peculiar periodicity of symptoms can be explained only by the agency of a parasitic organism presenting definite alternating periods of latency and activity." A somewhat similar conception appears to be held by the Thompson-McFadden Commission,[8] which distinguishes between conditions favorable for the development of the disease, in the first place, and those that permit its subsequent recurrence. Why these and many other observers should consider this periodicity of symptoms as explicable only by the agency of a parasitic organism or of a virus or a toxin presenting definite alternating periods of latency and activity is rather hard to understand when it is recalled that in endemic scurvy,[9] and particularly in endemic beriberi,[10] diseases of well known dietary origin, a strikingly similar periodicity is present. It would seem, therefore, entirely permissible to invoke as an explanation of the periodic recurrence in pellagra what undoubtedly is the explanation of the same phenomenon in these other diseases, namely, a modification or change in diet brought about by or incidental to the recurring seasons. Viewed in this light, the recurrence in pellagra may be considered as in beriberi, etiologically at least, as essentially identical with the initial attack; and therefore it would seem permissible to conclude that the means found effective in the prevention of recurrences will be found effective in the prevention of the initial attack.

NATURE OF THE DISEASE

In the course of the preliminary studies relating to the prevalence of pellagra at such institutions as prisons, asylums and orphanages, to which reference was made early in this paper, the association was found of a very high incidence of pellagra, restricted to certain groups, with a diet which differed from the diet of the exempt groups, so far as could be determined, only in that it included minimal quantities of the animal foods. It was inferred at that time that this association had etiologic significance. Advantage has been taken of an opportunity to put this inference to the test of experiment. The experiment was carried out in association with Assistant Surgeon G. A. Wheeler at the farm of the Mississippi State Penitentiary, about 8 miles east of Jackson, Miss.

At about the center of this farm of 3,200 acres, well isolated from the surrounding community, is the convict "camp." There is no history of the previous occurrence or presence of pellagra on this farm. During the period of the experiment there were quartered at the "camp" an average of between seventy and

7. Sambon, L. W.: Progress Report on the Investigation of Pellagra, Jour. Trop. Med. and Hyg., 1910.
8. Siler, J. F.; Garrison, P. E., and MacNeal, W. J.: The Relation of Methods of Disposal of Sewage to the Spread of Pellagra, Arch. Int. Med., October, 1914, p. 453; Further Studies of the Thompson-McFadden Pellagra Commission, The Journal A. M. A., Sept. 26, 1914, p. 1090; A Statistical Study of the Relation of Pellagra to Use of Certain Foods and to Location of Domicile in Six Selected Industrial Communities, Arch. Int. Med., September, 1914, p. 293.
9. Lind, James: A Treatise on the Scurvy, Ed. 3, London, 1772, pp. 33, 84, 130, 306.
10. Scheube, B.: The Diseases of Warm Countries, London, 1903.

eighty white male convicts, of whom about thirty were present throughout this time. Through the kind offices of Dr. E. H. Galloway, secretary of the Mississippi State Board of Health, the interest of Governor Earl Brewer was enlisted, who, on the offer of a pardon, obtained twelve volunteers for the test.

Experiment.—White adult males were selected because, judged by the incidence of the disease in the population at large, this age, sex and race group would seem to be the least susceptible to the disease.

The "pellagra squad," as it came to be called, was organized between Feb. 1 and Feb. 4, 1915, with twelve volunteers. July 1, 1915, one of the squad was released because of the development of a physical infirmity. This left eleven men in the squad, from 24 to 50 years of age, who remained in the test to its termination, Oct. 31, 1915. These men were quartered in a small, practically new, screened cottage, about 500 feet from the "cage" in which the other convicts were domiciled. Part of this cottage had previously been used, and continued to be used, throughout the period of the experiment as quarters for one of the officers of the "camp." From the time of its organization, the squad was segregated and under special guard.

From Feb. 4 to April 19, 1915, a period of two and one half months, these men were kept under observation without any change in the regular prison fare. As no evidence of pellagra during this preliminary observation period was detected, the diet of the squad was changed at noon, April 19, 1915. The ingredients of this diet were wheat flour (patent), corn meal, (corn) grits, corn starch, white polished rice, standard granulated sugar, cane syrup, sweet potatoes, pork fat (fried out of salt pork), cabbage, collards, turnip-greens and coffee. In the preparation of the biscuits and of the corn bread "Royal" baking powder was used.

The quantities of the different articles of cooked food actually consumed are illustrated by the following for the week ended Aug. 8, 1915: biscuits, 41.81 pounds; rice, 24.25 pounds; corn bread, 24.56 pounds; grits, 27.06 pounds; fried mush, 33.87 pounds; brown gravy, 37.81 pounds; sweet potatoes, 23.62 pounds; cabbage, 4.25 pounds; collards, 23.75 pounds; cane syrup, 5.94 pounds; sugar, 8.75 pounds, making a total of 255.67 pounds of food consumed during the week, or 3.32 pounds per man per day, having a value of 2,952 calories.

In this connection it may be pertinent to note that the corn meal and grits were of the best quality obtainable at the local market, and the same as that used at one of the orphanages at which the test, already discussed, of the value of diet in prevention, was made, and at which no pellagra occurred this year. Except for one meal in which 4 ounces of meat were included, the animal proteins and legumes were almost entirely excluded.

The character of the labor performed by these men during the week for which the statement of the quantity of food consumed has been given was as follows: whitewashing fences and buildings, two and one half days; sawing lumber (ram saw mill) two days; rest, two and one half days.

The volunteers kept about the same hours and did about the same kind of work as the other convicts. The amount of labor performed by the volunteers, however, was distinctly less than that by the other convicts.

The general sanitary environment was the same for volunteers and controls. With respect to personal cleanliness, cleanliness of quarters, and freedom from insects, particularly bedbugs, flies and mosquitoes, the volunteers were decidedly better off.

Results.—Of the eleven volunteers, not less than six developed symptoms, including a "typical" dermatitis, justifying a diagnosis of pellagra. Loss of weight and strength and mild nervous symptoms appeared early. The gastro-intestinal symptoms were slight. Definite cutaneous manifestations were not noted until September 12, or about five months after the beginning of the restricted diet. In all six cases the skin lesions were first noted on the scrotum. Later the eruption also appeared on the hands in two of the cases, and on the back of the neck in one. The scrotal lesion conformed to the type described and figured by Merk[11] and also by Stannus.[12]

Although the entire population of the "camp" was kept under observation, no one, not of the volunteer squad, presented evidence justifying even a suspicion of pellagra.

The diagnosis of pellagra was concurred in by Dr. E. H. Galloway, secretary of the Mississippi State Board of Health, and Dr. Nolan Stewart, formerly superintendent of the Mississippi Asylum for the Insane, at Jackson. In excluding the other known dermatoses, the expert knowledge and skill of Prof. Marcus Haase of the Medical College of the University of Tennessee, Memphis, Tenn., and of Prof. Martin F. Engman of the Washington University Medical School, St. Louis, were utilized in consultation.

Conclusions. — The conclusion drawn from this experiment is that pellagra has been brought about in at least six of the eleven volunteers as the result of the one-sided diet on which they subsisted. Taken in conjunction with the striking results of the test of the preventive value of diet, the further conclusion seems justified that pellagra is essentially of dietary origin.

In order to avoid misunderstanding, it may be well to point out that it does not necessarily follow that all one-sided, "unbalanced" or, as I prefer for the present to speak of them, "faulty" diets are capable of bringing about pellagra any more than they are of bringing about scurvy or beriberi.

A definite conclusion as to the intimate mechanism involved in bringing about or in preventing the disease by diet cannot, of course, be drawn from the available data. It would be premature to conclude that pellagra is necessarily due to a lack or deficiency of fresh animal or leguminous protein foods. Clearly, however, the dietary "fault" on which the production of pellagra essentially depends is capable of being corrected or prevented by including in the diet a suitable proportion of these foods. It would be equally premature, moreover, to assume that the pellagra-causing dietary "fault" is capable of correction in this way only. The possibility that there may be other foods capable of serving the same purpose is by no means to be overlooked. If Funk's[13] suggestion that pellagra is a vitamin deficiency, brought about by the consumption of overmilled corn, is proved to be correct, it may be, too, that the use of undermilled corn will of itself

11. Merk, Ludwig: Die Hauterscheinungen der Pellagra, Innsbruck, 1909, p. 24, Fig. 6.
12. Stannus, Hugh S.: Pellagra in Nyasaland, Tr. Soc. Trop. Med. and Hyg., 1913, vii, 32.
13. Funk, Casimir: Die Vitamine, Wiesbaden, 1914. Prophylaxie und Therapie der Pellagra ins Lichte der Vitaminlehre, München. med. Wchnschr., 1914, p. 698.

TUESDAY

Breakfast.—Oatmeal, sweet milk, sugar, Hamburger steak, biscuits, hot rolls, coffee.
Dinner.—Beef stew, potatoes, rice, bread, buttermilk.
Supper.—Baked beans, light bread, coffee, sugar, buttermilk.

WEDNESDAY

Breakfast.—Oatmeal, sweet milk, sugar, beef hash, hot rolls, biscuits, coffee.
Dinner.—Pea soup, corn bread, gravy, potatoes, rice, bread, buttermilk.
Supper.—Stewed prunes, light bread, coffee, sugar, buttermilk.

THURSDAY

Breakfast.—Oatmeal, sweet milk, sugar, fried steak, hot rolls, biscuits, coffee.
Dinner.—Beef stew, peas, potatoes, rice, bread, buttermilk.
Supper.—Baked beans, bread, coffee, sugar, buttermilk.

FRIDAY

Breakfast.—Oatmeal, sweet milk, sugar, broiled beef steak, hot rolls, biscuits, coffee.
Dinner.—Pea soup (purée), roast beef, potatoes, rice, bread, buttermilk.
Supper.—Light bread, coffee, sugar, buttermilk, apples, baked beans.

SATURDAY

Breakfast.—Oatmeal, sweet milk, sugar, Hamburger steak, hot rolls, biscuits, coffee.
Dinner.—Beef stew, potatoes, rice, bread, buttermilk.
Supper.—Bread, baked beans, buttermilk, coffee, sugar.

SUNDAY

Breakfast.—Oatmeal, sweet milk, sugar, mackerel, bread, coffee.
Dinner.—Loaf beef and gravy, peas, potatoes, rice, bread, buttermilk, pudding.
Supper.—Beef hash, bread, sugar, coffee, buttermilk.

NOTE.—Green vegetables in season at irregular intervals. Milk and eggs, as a special diet, are furnished those patients who may require them.

Aside from the modification in the diet and the increased watchfulness over the individual feeding, enjoined on the nurses and attendants, no change in the habitual routine of the corresponding services was made.

Of the pellagrins admitted to these wards at the time of their organization, or shortly thereafter—that is, up to Dec. 31, 1914—seventy-two (thirty-six colored and thirty-six white) remained continuously under observation up to Oct. 1, 1915, or, at least, until after the anniversary date of their attack of 1914. Of the colored patients, eight have histories of at least two annual attacks; of the white patients, ten have histories of at least two attacks. Nevertheless not a single one of this group of seventy-two patients has presented recognizable evidence of a recurrence of pellagra, although of a group of thirty-two control pellagrins (seventeen colored and fifteen white) not receiving the modified diet, fifteen (nine colored, six white), or 47 per cent., have had recurrences during the corresponding period.

Significance.—Considering the foregoing results as a whole, bearing in mind that three different institutions are involved, each institution an endemic focus of the disease, and bearing in mind also that the number of individuals is fairly large, it would seem that the conclusion is justified that the pellagra recurrence may be prevented and, in view of the conditions of the experiment, that it may be prevented without the intervention of any other factor than diet. In this connection the question arises whether it is permissible to extend this conclusion to the primary attack, apart from its recurrence. The character of the answer to this question will depend on the view held as to the nature of the pellagra recurrence.

Among the epidemiologic features of pellagra, none is more striking than the tendency for the disease not only to develop in spring or early summer, but also to recur year after year at about the same season. Various explanations of this singular phenomenon have been advanced. According to Sambon,[7] "this peculiar periodicity of symptoms can be explained only by the agency of a parasitic organism presenting definite alternating periods of latency and activity." A somewhat similar conception appears to be held by the Thompson-McFadden Commission,[8] which distinguishes between conditions favorable for the development of the disease, in the first place, and those that permit its subsequent recurrence. Why these and many other observers should consider this periodicity of symptoms as explicable only by the agency of a parasitic organism or of a virus or a toxin presenting definite alternating periods of latency and activity is rather hard to understand when it is recalled that in endemic scurvy,[9] and particularly in endemic beriberi,[10] diseases of well known dietary origin, a strikingly similar periodicity is present. It would seem, therefore, entirely permissible to invoke as an explanation of the periodic recurrence in pellagra what undoubtedly is the explanation of the same phenomenon in these other diseases, namely, a modification or change in diet brought about by or incidental to the recurring seasons. Viewed in this light, the recurrence in pellagra may be considered as in beriberi, etiologically at least, as essentially identical with the initial attack; and therefore it would seem permissible to conclude that the means found effective in the prevention of recurrences will be found effective in the prevention of the initial attack.

NATURE OF THE DISEASE

In the course of the preliminary studies relating to the prevalence of pellagra at such institutions as prisons, asylums and orphanages, to which reference was made early in this paper, the association was found of a very high incidence of pellagra, restricted to certain groups, with a diet which differed from the diet of the exempt groups, so far as could be determined, only in that it included minimal quantities of the animal foods. It was inferred at that time that this association had etiologic significance. Advantage has been taken of an opportunity to put this inference to the test of experiment. The experiment was carried out in association with Assistant Surgeon G. A. Wheeler at the farm of the Mississippi State Penitentiary, about 8 miles east of Jackson, Miss.

At about the center of this farm of 3,200 acres, well isolated from the surrounding community, is the convict "camp." There is no history of the previous occurrence or presence of pellagra on this farm. During the period of the experiment there were quartered at the "camp" an average of between seventy and

7. Sambon, L. W.: Progress Report on the Investigation of Pellagra, Jour. Trop. Med. and Hyg., 1910.
8. Siler, J. F.; Garrison, P. E., and MacNeal, W. J.: The Relation of Methods of Disposal of Sewage to the Spread of Pellagra, Arch. Int. Med., October, 1914, p. 453; Further Studies of the Thompson-McFadden Pellagra Commission, The Journal A. M. A., Sept. 26, 1914, p. 1090; A Statistical Study of the Relation of Pellagra to Use of Certain Foods and to Location of Domicile in Six Selected Industrial Communities, Arch. Int. Med., September, 1914, p. 293.
9. Lind, James: A Treatise on the Scurvy, Ed. 3, London, 1772, pp. 33, 84, 130, 306.
10. Scheube, B.: The Diseases of Warm Countries, London, 1903.

eighty white male convicts, of whom about thirty were present throughout this time. Through the kind offices of Dr. E. H. Galloway, secretary of the Mississippi State Board of Health, the interest of Governor Earl Brewer was enlisted, who, on the offer of a pardon, obtained twelve volunteers for the test.

Experiment.—White adult males were selected because, judged by the incidence of the disease in the population at large, this age, sex and race group would seem to be the least susceptible to the disease.

The "pellagra squad," as it came to be called, was organized between Feb. 1 and Feb. 4, 1915, with twelve volunteers. July 1, 1915, one of the squad was released because of the development of a physical infirmity. This left eleven men in the squad, from 24 to 50 years of age, who remained in the test to its termination, Oct. 31, 1915. These men were quartered in a small, practically new, screened cottage, about 500 feet from the "cage" in which the other convicts were domiciled. Part of this cottage had previously been used, and continued to be used, throughout the period of the experiment as quarters for one of the officers of the "camp." From the time of its organization, the squad was segregated and under special guard.

From Feb. 4 to April 19, 1915, a period of two and one half months, these men were kept under observation without any change in the regular prison fare. As no evidence of pellagra during this preliminary observation period was detected, the diet of the squad was changed at noon, April 19, 1915. The ingredients of this diet were wheat flour (patent), corn meal, (corn) grits, corn starch, white polished rice, standard granulated sugar, cane syrup, sweet potatoes, pork fat (fried out of salt pork), cabbage, collards, turnip-greens and coffee. In the preparation of the biscuits and of the corn bread "Royal" baking powder was used.

The quantities of the different articles of cooked food actually consumed are illustrated by the following for the week ended Aug. 8, 1915: biscuits, 41.81 pounds; rice, 24.25 pounds; corn bread, 24.56 pounds; grits, 27.06 pounds; fried mush, 33.87 pounds; brown gravy, 37.81 pounds; sweet potatoes, 23.62 pounds; cabbage, 4.25 pounds; collards, 23.75 pounds; cane syrup, 5.94 pounds; sugar, 8.75 pounds, making a total of 255.67 pounds of food consumed during the week, or 3.32 pounds per man per day, having a value of 2,952 calories.

In this connection it may be pertinent to note that the corn meal and grits were of the best quality obtainable at the local market, and the same as that used at one of the orphanages at which the test, already discussed, of the value of diet in prevention, was made, and at which no pellagra occurred this year. Except for one meal in which 4 ounces of meat were included, the animal proteins and legumes were almost entirely excluded.

The character of the labor performed by these men during the week for which the statement of the quantity of food consumed has been given was as follows: whitewashing fences and buildings, two and one half days; sawing lumber (ram saw mill) two days; rest, two and one half days.

The volunteers kept about the same hours and did about the same kind of work as the other convicts. The amount of labor performed by the volunteers, however, was distinctly less than that by the other convicts.

The general sanitary environment was the same for volunteers and controls. With respect to personal cleanliness, cleanliness of quarters, and freedom from insects, particularly bedbugs, flies and mosquitoes, the volunteers were decidedly better off.

Results.—Of the eleven volunteers, not less than six developed symptoms, including a "typical" dermatitis, justifying a diagnosis of pellagra. Loss of weight and strength and mild nervous symptoms appeared early. The gastro-intestinal symptoms were slight. Definite cutaneous manifestations were not noted until September 12, or about five months after the beginning of the restricted diet. In all six cases the skin lesions were first noted on the scrotum. Later the eruption also appeared on the hands in two of the cases, and on the back of the neck in one. The scrotal lesion conformed to the type described and figured by Merk[11] and also by Stannus.[12]

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Conclusions. — The conclusion drawn from this experiment is that pellagra has been brought about in at least six of the eleven volunteers as the result of the one-sided diet on which they subsisted. Taken in conjunction with the striking results of the test of the preventive value of diet, the further conclusion seems justified that pellagra is essentially of dietary origin.

In order to avoid misunderstanding, it may be well to point out that it does not necessarily follow that all one-sided, "unbalanced" or, as I prefer for the present to speak of them, "faulty" diets are capable of bringing about pellagra any more than they are of bringing about scurvy or beriberi.

A definite conclusion as to the intimate mechanism involved in bringing about or in preventing the disease by diet cannot, of course, be drawn from the available data. It would be premature to conclude that pellagra is necessarily due to a lack or deficiency of fresh animal or leguminous protein foods. Clearly, however, the dietary "fault" on which the production of pellagra essentially depends is capable of being corrected or prevented by including in the diet a suitable proportion of these foods. It would be equally premature, moreover, to assume that the pellagra-causing dietary "fault" is capable of correction in this way only. The possibility that there may be other foods capable of serving the same purpose is by no means to be overlooked. If Funk's[13] suggestion that pellagra is a vitamin deficiency, brought about by the consumption of overmilled corn, is proved to be correct, it may be, too, that the use of undermilled corn will of itself

11. Merk, Ludwig: Die Hauterscheinungen der Pellagra, Innsbruck, 1909, p. 24, Fig. 6.
12. Stannus, Hugh S.: Pellagra in Nyasaland, Tr. Soc. Trop. Med. and Hyg., 1913, vii, 32.
13. Funk, Casimir: Die Vitamine, Wiesbaden, 1914. Prophylaxie und Therapie der Pellagra ins Lichte der Vitaminlehre, München. med. Wchnschr., 1914, p. 698.

correct the "fault" in a diet in which this cereal is the staple. There is to be considered also Voegtlin's explanation of the beneficial effect of a liberal diet on the course of the disease. Voegtlin suggests that by substituting animal foodstuffs for part of the vegetable food the absolute amount of vegetable products consumed will be reduced considerably, and thus probably also reduce the possibility of an injurious action of the vegetable food on the body, particularly the irritant action on the gastro-intestinal canal. On the whole, however, the trend of available evidence strongly suggests that pellagra will prove to be a "deficiency" disease very closely related to beriberi.

For the practical purposes of preventive medicine, the point of chief, of fundamental, importance would seem to be the recognition of the fact that the pellagra-producing dietary "fault," whatever its intimate nature or however brought about, is capable of correction or prevention, as the results of the studies summarized above clearly indicate, by including in the diet suitable proportions of the fresh animal and leguminous protein foods.[14]

SUMMARY

1. Diet is the common factor in the various methods of treatment recently advocated. The marked success claimed for each of these methods must logically be attributed to the factor (diet) which they have in common.

2. The value of diet in the prevention of pellagra has been tested at two orphanages and at an asylum for the insane, endemic foci of the disease. Marked increases in the fresh animal and leguminous protein elements of the institution diets were made.

Of 209 cases of pellagra observed at the two orphanages during the spring and summer of 1914, not less than 172 completed at least the anniversary date of their attack under observation. In only one of these 172 pellagrins, following the change in diet, was there recognized evidence of a recurrence, although on the basis of experience elsewhere, from ninety-nine to 130 might reasonably have been expected. Nor was any new case observed among the nonpellagrin residents, 168 of whom completed not less than one year under observation.

Of the group of pellagrins on the modified diet at the insane asylum, seventy-two remained continuously under observation up to Oct. 1, 1915, or at least until after the anniversary date of their attack of 1914. Not one of this group has presented recognizable evidence of a recurrence, although, of a group of thirty-two controls, fifteen have had recurrences. Pellagra may, therefore, be prevented by an appropriate diet without any alteration in the environment, hygienic or sanitary, including the water supply.

3. At an isolated convict camp, previously free from pellagra, with an average population of from seventy to eighty white males, eleven volunteers were segregated and, after a preliminary observation period of two and one half months, placed on an abundant but one-sided, chiefly carbohydrate (wheat, corn, rice) diet, from which fresh animal proteins and legumes were excluded. At least six of these volunteers developed pellagra. This result would appear to have been brought about by the diet on which they subsisted.

4. A definite conclusion as to the intimate mechanism involved in bringing about or in preventing the disease by diet cannot be drawn from the available data.

5. For the practical purposes of preventive medicine, it would seem to be of fundamental importance to recognize that the pellagra-producing dietary "fault," whatever its intimate nature or however brought about, is capable of correction or prevention by including in the diet suitable proportions of the fresh animal and leguminous protein foods.

14. In addition to the references already given, the following will be found of interest:

Goldberger, Joseph: The Etiology of Pellagra: the Significance of Certain Epidemiological Observations with Respect Thereto, Pub. Health Rep., Washington, June 26, 1914, p. 1683; The Cause and Prevention of Pellagra, ibid., Sept. 11, 1914; Beans for Prevention of Pellagra, THE JOURNAL A. M. A., Oct. 10, 1914, p. 1314.

Goldberger, Joseph; Waring, C. H., and Willets, D. G.: The Treatment and Prevention of Pellagra, Pub. Health Rep., Oct. 23, 1914, p. 126; Reprint 228 from Pub. Health Rep.; id. revised Jan. 15, 1915.

Goldberger, Joseph, and Wheeler, G. A.: Experimental Pellagra in the Human Subject Brought About by a Restricted Diet, Pub. Health Rep., Nov. 12, 1915, p. 3336.

Meyers, C. N., and Voegtlin, Carl: Soluble Aluminum Compounds: Their Occurrence in Certain Vegetable Products, Pub. Health Rep., June 19, 1914, p. 1625.

DRUG ADDICTION

ANALYSIS OF ONE HUNDRED AND FORTY-SEVEN CASES AT THE PHILADELPHIA GENERAL HOSPITAL *

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Our studies were commenced with the idea of determining the merits of the Lambert treatment as compared with other methods of treating drug addictions, and to ascertain the relative value of the various units of this method. In the course of our study many other points of interest developed, some of which we have included in our paper. All of these patients were discharged several months ago and the records are now on file at the hospital. Each patient, however, was thoroughly examined and carefully observed by one of us (Dr. McIver) during his sojourn in the institution.

The large number of patients coming to the hospital as the direct result of the Harrison Narcotic Law, and the fact of their being under restraint and control, offered unusual facilities for purposes of observation. The number studied, 147, while not representing all the material at our disposal, we believed ample for our purpose, and we further felt that a careful analysis of this number was preferable to a more superficial study, or mere reference to the histories, of a larger number of cases.

In our series we found that many of the patients used only one drug, thirty-eight taking morphin exclusively, and twenty-seven using only heroin. The majority of the patients used the drugs in various combinations, twenty-one indulging in heroin and cocain, while three of the number used cocain, heroin, morphin and hop (opium smoking).

Duration of the Addiction.—In a study of the average duration of the various addictions, we find that of morphin the longest, next opium smoking, then cocain and last heroin. Eighty-one had taken morphin for an average of 9.1 years; two had been using the drug for thirty-one years; one for thirty-five years, and one for thirty-nine years. The average duration of the opium-smoking in forty-three cases was 5.4 years.

*Read before the Section on General Medicine of the College of Physicians of Philadelphia, Dec. 13, 1915.

One man "hit the pipe" for twenty, and one for thirty, years. Forty-six cocain "sniffers" had an average duration of 2.5 years, while in eighty-two heroin cases the average duration of the habit was approximately two years.

Amount of Drugs Taken Daily.—The average daily dose of morphin taken by our patients was 15.3 grains, the largest amount taken by any patient being 90 grains. In comparison with these figures it is interesting to note that L. P. Brown[1] estimated the average daily dose of morphin addicts of Tennessee to be 8½ grains. Our heroin patients averaged 9½ grains daily, 30 grains being the largest amount taken in twenty-four hours by any one of the patients. We were unable to form any estimate of the amount of opium smoked or of cocain used; the difficulty in the case of the latter being due to the habit of "sniffing" the drug in unmeasured bulk, and the irregularity with which the patients indulged in its use.

Etiology.—The age at which the habit was formed was of interest chiefly in showing the youth of many of the patients when they first indulged in this form of social dissipation. Two commenced at 16, and two at 17 years. One first used morphin at 15 and one at 17 years. Five began to use heroin when 17 years old and one when 16. By a curious coincidence five patients also commenced to sniff cocain at the age of 17 and one at 16 years.

One hundred and three were males and forty-four were females; ninety-eight were white, two were Mongolians and three were negroes. In view of the fact that so many of the Southern negroes are addicted to the use of drugs, we were surprised that the colored race should furnish so small a proportion of the total number. The majority of women were prostitutes, and some few of the men were or had been cadets. A number were notorious crooks and thieves. In all, over fifty occupations were represented, among the number being one physician, two nurses and three druggists. The majority were dwellers in, or frequenters of, the "tenderloin."

In considering the question of degeneracy, signs of arrested development, such as abnormalities in the shape and size of the ears and palate, irregularities in the arrangement of the teeth, abnormally shaped heads and marked facial asymmetry, were carefully studied. Of the 147 patients, fifty-nine, or 40 per cent., presented one or more of these stigmata to a well-marked degree.

Some writers have emphasized the fact that "neurotics" tend to acquire the cocain habit rapidly and Block[2] says that "Normal persons never become drug habitués." While we believe that Block's contention is true as regards the majority of drug addicts, our observation is that normal persons may and do become habituated to the use of morphin through taking it over a considerable period of time for the relief of pain or insomnia; however, these patients, should the cause be removed, offer the best prognosis.

When questioned as to why the habit of opium-smoking had been formed, all who so used the drug stated that it was first indulged in for pleasure and acquired through association in the "tenderloin." Of the morphin users, the largest number, twenty-eight, learned of the effects of the drug through its hypodermic administration by a physician or through a physician's prescription. The next largest number, twenty, first used morphin as an alternate or substitute for opium smoking. Eighteen acquired the habit through association as a social diversion; ten took morphin for the first time on their own initiative for the relief of pain or insomnia; six used it as a substitute for heroin and five were made victims of the drug while patients in various hospitals in our own city. Of those who used the alkaloid heroin, the largest number, fifty-six, acquired the habit through association. Twenty took heroin instead of smoking opium, or as a substitute for morphin, when these drugs became difficult to obtain. The remaining seven resorted to the drug to relieve the effect of alcoholic excesses, insomnia, headache, etc.

On analyzing the origin of the cocain habit, we found that of forty-three cases, thirty-two patients first learned to sniff the drug purely for pleasure and ten to overcome the depressing after-effects of morphin indulgence. One young man first used cocain on the advice of an instructor in college, as a cerebral stimulant.

While these figures prove conclusively that a vast majority of cases of opium smoking, heroin and cocain sniffing are acquired through association, we would emphasize the fact that the largest single factor in the production of morphinism has been professional medication.

Association of Alcohol with the Drug Addiction.—One hundred and eight patients in our series said they had never used alcohol at all, giving a very high percentage even after making considerable allowance for possible misstatements. None were confirmed alcoholics, although a number used alcohol to excess prior to the formation of the drug habit. De Quincey, in his Confessions of an English Opium Eater, made an interesting contribution to this phase of the problem as follows: "I do not readily believe that any man having once tasted the divine luxuries of opium, will afterwards descend to the gross and mortal enjoyment of alcohol."

The only patient who had used alcohol freely in association with morphin lacked the usual surface pallor and dry skin of the opium habitué, despite the fact that he had taken large amounts of morphin over a period of many years. In his case we believe the vasodilator effect of the alcohol had counteracted the usual cutaneous effect of the morphin.

Opium Smoking and Morphinism.—These habits are so old and so much has been written about them, that a separate discussion would be mere repetition. A few words about the habits of more recent origin, cocainism and heroinism, may not be inappropriate at this place.

Cocain Addictions.—While the habit of using cocain antedates by some years that of heroin sniffing, our statistics show that the development and spread of these habits in the Philadelphia "tenderloin" districts were practically parallel. The manner in which these "tenderloin" habitués formed the habit (chiefly through association) is in marked contrast to that of the earlier patients, most of whom became addicted through the use of "patent medicines" containing the drug, or through local use and abuse of cocain in the treatment of pathologic conditions of the nose and throat. Fortunately the Food and Drug Law has practically abolished the sale of "patent medicines" containing cocain, and nose and throat specialists are now more conservative in their use of the drug. Refer-

1. Brown, L. P.: The Drug Habit in Tennessee, abstr., THE JOURNAL A. M. A., May 2, 1914, p. 1427.
2. Block: New York Med. Jour., Feb. 27, 1915, p. 405.

ring to this earlier period, C. E. de M. Sajous and L. T. de M. Sajous[3] say: "Occupation is a predominant factor, most of the victims having been medical men, members of the legal profession, literary men and women and the cultured generally."

We believe at present this type represents only what we may term the sporadic cases, the condition, however, being epidemic in the "tenderloin." Where the indulgence was formerly chiefly solitary, it has now become chiefly social.

None of the cases presented the classical sign of cocainomania, the sensation as of something crawling on the skin, the hallucination of the "cocain-bug"; and we believe that this symptom has received an exaggerated importance. In this connection it will be noted that W. D. Owens[4] found the symptom only once in twenty-three cases of cocain addiction.

In no instance did we find vasomotor dilatation.

All of the patients sniffed the drug in the manner described later under heroin habit. In no instance was there any difficulty in withdrawing the cocain; in all but one case it was stopped immediately, and in this exception only one dose was given.

Heroin Habit.—About 1898 the medical profession began using heroin, then thought to be a safe and efficient drug. Some time later it was noticed that patients had become addicted to the use of this drug, but not to the same extent as was the case with morphin.

About 1912 the dissipated and vicious began the use of heroin. With this class the use of this drug is distinctly a social diversion. There are quite a few, however, who began the use of heroin as a substitute for the habit of opium smoking. These were perhaps the pioneers.

About 1910-1911 there was a restriction placed on the importation and sale of crude opium; it naturally became very expensive and could only be obtained in small quantities by those who could afford it at all. Prior to this time the opium pipe was the great source of pleasure to the denizens of the "tenderloin." This perhaps will help to explain why those who had habits already formed began using heroin. They had to resort to something less expensive. For the past three years the heroin habit has been spreading among the habitués of the "tenderloin" at a terrific rate. No other drug has ever claimed half so many victims in such a short time. Why the spread has been so rapid is rather difficult to explain, other than that it is indulged in as a luxury and to relieve their excesses. Many stated that while heroin did not stimulate their sexual desire, they would take it because it enabled them to prolong the sexual act.

Prior to the time when the antinarcotic law was enacted, heroin tablets could be obtained at a reasonable price from various drug stores, "dope" pedlers on the street and from unscrupulous, unlicensed dealers. These people bought the drug in large quantities and perhaps at wholesale prices, stored it away to be sold and distributed by their agents at an enormous profit. They were known in the "tenderloin" as "dope kings."

The pills were crushed, preferably in a small box or paper, and for this the piston from an ordinary hypodermic syringe answered the purpose admirably. The fine powder was then taken up into a glass tube of small bore to the end of which was attached a piece of rubber tubing. The glass was inserted into the nostrils, the rubber in the mouth and the drug blown up into the nose. When the tube was not accessible the powder was placed on the dorsum of the hand, held semiprone and sniffed up the nostrils. Why this method is so universally adopted by the social users of both heroin and cocain is evidently due to the fact that these drugs are absorbed so readily from the nasal mucous membrane.

In contrasting the deleterious effects of heroin with those of morphin, we find that the former is far less harmful. Our morphin patients usually gave the history of having one or two bowel movements a week, while the heroin addicts seldom went longer than two or three days and often experienced but little or no trouble.

In heroinism the pallor was not so marked, the emaciation not so pronounced, nor the symptoms of drug starvation as severe as in morphinism. Heroin could be withdrawn in a far shorter time and with a great deal less discomfort or suffering than could morphin. The former drug does not check the secretions of the lungs and alimentary canal to the same extent as the latter. A bibliography of the most important articles on heroin addiction will be found in Farr's[5] admirable paper.

Pathology and Symptomatology.—No pathologic studies were made by us, and most of our observations of symptoms were confined to those following withdrawal of the drugs, as treatment was instituted promptly on admission of the patients.

Symptoms of Withdrawal or Abstinence Phenomena.—These were observed to some extent in every case and we will here merely enumerate the various symptoms presented: yawning, sneezing, and lacrimation, early, and later insomnia, nervousness, restlessness, anorexia, nausea, vomiting, pain in the abdomen and lower extremities, diarrhea, profuse perspiration, tachycardia, nocturnal emissions, marked asthenia, weak pulse and collapse. There was no rise of temperature exept with complications. In a few cases the temperature was subnormal.

That the withdrawal symptoms in chronic morphinism are due to the formation and the presence in the blood serum of an antidotal toxic substance has been proved by the experiments of Adriano Valenti[6] at the University of Pavia. Dogs were habituated to large doses of morphin and the drug then abruptly discontinued. Not only would these dogs then manifest the usual circulatory withdrawal symptoms seen in human beings addicted to morphin, but the same phenomena were obtained by injecting their serum in normal dogs. This reaction was not obtained when the serum of unmorphinized dogs was used.

Bishop[7] claims to have been the originator of the theory of the manufacturing of an antidotal toxic substance by the body and refers to his publication in THE JOURNAL,[8] evidently having overlooked the articles of Hirschloff,[9] in 1904.

3. Sajous and Sajous: Analytic Cyclopedia of Practical Medicine, iii, 506.

4. Owens, W. D.: Signs and Symptoms Presented by Those Addicted to Cocain: Observations in a Series of Twenty-Three Cases, THE JOURNAL A. M. A., Feb. 3, 1912, p. 329.

5. Farr: The Relative Frequency of the Morphin and Heroin Habits, New York Med. Jour., May 1, 1915.

6. Symptoms in Chronic Morphinism Induced by Withdrawal of the Drug, editorial, THE JOURNAL A. M. A., May 23, 1914, p. 1662.

7. Bishop, E. S.: New York Med. Jour., Feb. 27, 1915.

8. Bishop, E. S.: Narcotic Addiction—A Systemic Disease Condition, THE JOURNAL A. M. A., Feb. 8, 1913, p. 431.

9. Hirschloff: Riedel's Berichte, 1904, p. 27; also abstr., Jahresb. f. Neurol. u. Psychiat., 1904, p. 1228, quoted by Dercum: The Tools of Our Trade, THE JOURNAL A. M. A., March 13, 1915, p. 882.

Prognosis.—In considering the prognosis of drug addiction two distinct questions are presented: first, the withdrawal of the drug, and second, the permanency of the results.

With the morphin cases we found that with the exception of a few long-standing cases, patients who were taking exceptionally large doses, the drug could be withdrawn in from ten days to two weeks without causing any special discomfort. As regards the permanency of the results, a large percentage of our patients have returned for a second treatment, some for a third and a few for a fourth. A few perhaps remained free from the drug, but only a few. Some were free for a week, two weeks or a month, but many stated that they resumed the use of the drug the same day they were discharged. It has also been the experience of one of us in private practice that the majority of patients even after they have been off the drug for months, and have been brought to the best possible physical condition, soon relapse and without adequate cause. It is a question if the majority of morphin addicts really want to stop using the drug. There is, however, a certain percentage who do want to free themselves from the habit and who sincerely aid in the attempt, and they should not suffer because of the insincerity of the larger number.

While we do not, therefore, indorse the statement of one writer that the morphin habit "Is as incurable as inoperable cancer," our experience would cause us to be somewhat skeptical regarding the very high percentage of permanent cures reported by proprietors of certain institutions devoted to the treatment of alcohol and drug habits.

As already stated, we found heroin not only less severe in its systemic effects than morphin, but also easier to withdraw.

In regard to the prognosis of cocainism, we find that it is better than in the case of opium alkaloids; the drug is readily withdrawn and abstinence phenomena are not severe, as in the case of alcohol and morphin. Our experience with the cocain habitué is therefore in accord with that of Higier.[10]

TREATMENT OF DRUG ADDICTIONS

All drug addicts should be placed where they can be detained until it is considered safe by the physician in charge for them to leave. An institution for the treatment of these cases should preferably be located in the country or suburbs and surrounded by ample grounds.

The building should be of modern construction, with plenty of light and ventilation, and preferably each patient should have a separate room. A hydrotherapy room is desirable; electric batteries for massage will prove of great value; closets for the drugs to be used must be kept locked and concealed from view.

On admission to the institution all patients should have a complete change of clothing and a most careful search made by a responsible party to see that they enter their rooms without any of the drugs. From the time these patients enter the hospital until they are discharged they must be kept under continuous and close observation.

Nurses or attendants should be on duty all the time, and they must be absolutely honest and trustworthy. In the treatment of no other trouble does so much depend on the strict reliability of nurses or attendants. They must be ever on the alert, for drug habitués are invariably well versed in the arts of deception.

The first thing to be accomplished in the treatment is the withdrawal of the drug. For the first twenty-four hours the patient should be given enough drug to keep him comfortable; by this method, one acquaints himself with just how much drug the patient really needs. No reliable information can be gained from the patient's statement as to how much he has been using, for even though he be telling the truth he invariably uses more than is necessary.

Patients should be given the same drug they have been accustomed to, and by their usual methods. Free purgation should be accomplished; the methods of catharsis as advised by Lambert is a very good one. Strychnin, so strongly advocated by Pettey, was not found necessary.

The drug must be withdrawn gradually, and especially is this true with the aged and the debilitated. As the drug is being withdrawn, the patients often suffer from nervousness and insomnia; these symptoms can be alleviated to a large degree with very hot baths. The bromids, trional, and scopolamin in ordinary dosage are also of great value here. For the nausea and vomiting, which are often so persistent, gastric lavage and restriction of diet are perhaps the best remedies. For the pains in the limbs, the so-called withdrawal pains, which are usually very annoying, electric massage will prove beneficial. Some of the coal tar derivatives, acetyl-salicylic acid (aspirin) and salicylates, may be used to advantage.

The diet should be nutritious and easily assimilated, consisting principally of milk and eggs. During this period the patient should be confined to bed. When the patient is well free of the drug and all the symptoms that follow its withdrawal, he may be given a more liberal diet, but this increase should be made gradually; at this time tonics are efficacious; when able to be up and about a systematic régime of exercise should be instituted, and patients must be taught to lead a quiet and well regulated life.

As to how long these patients should be detained, a great deal will depend on the individual case, but certainly not less than three months for the mildest type; some perhaps should be kept a year or more.

When a habitué leaves the sanatorium he should seek new environment and engage in some active work, fitted to his ability. He should live a God-fearing life, keeping ever in his mind the precious price he has paid for his future welfare and existence.

To care for these people only until they are relieved of the withdrawal symptoms is worse than useless.

METHODS OF TREATMENT COMPARED

In studying the comparative value of treatments, patients were treated as follows:

1. The original Lambert method.
2. Lambert's method without the Belladonna R.
3. Lambert's method without free purgation.
4. Gradual withdrawal.
5. Gradual withdrawal with free purgation.

The method employed was to select several patients for comparison, of approximately the same age, the same daily dose of the drug or drugs in combination and of the same duration. Our conclusions were as follows:

1. The original Lambert treatment was more satisfactory than the ordinary, gradual withdrawal.

10. Higier: München. med. Wchnschr., March 7, 1911.

2. The Lambert method without the free purgation (using ordinary purgation) was very unsatisfactory, patients suffering intensely and showing a marked tendency to delirium.

3. The Belladonna R. was the least important element in the Lambert treatment, having little or no greater value than other sedatives, besides having a tendency in certain cases to produce delirium.

4. Having a fixed dosage for each patient, as in Lambert's treatment, is an undesirable feature, which does not allow for individual differences; to disturb a patient every hour of the day and night is folly; and to try to blend him to a machine treatment is a very unwise procedure.

5. The best method proved to be gradual withdrawal with free purgation as in the Lambert treatment, and sedatives or stimulants as required in the individual case.

Patients using daily very large doses of drugs and over long periods of time can only have the drug withdrawn very gradually, without intense suffering or danger of collapse.

CONCLUSION

While the medical profession has had much to do with the formation of the morphin habit, and in former years with the development of the cocain habit, it has had little or nothing to do with the remarkable development and spread of the cocain, and especially the heroin, habit of the last few years. Farr has drawn a similar conclusion.

Degeneracy, as shown by actual signs of developmental arrest, is present in a large proportion of cases of drug addiction. The majority of narcotic drug habitués are not also addicted to the excessive use of alcohol.

Heroin is not as deleterious in its effects as morphin, and can be much more readily withdrawn.

The most valuable unit in the Lambert treatment is the method of free purgation. The Lambert treatment, while better than the old method of very slowly withdrawing the drug, is not as satisfactory as gradual withdrawal combined with free purgation and medication to meet the individual requirements.

Any treatment which does not take into consideration the presence of the antitoxic substance in the body long after the drug has been withdrawn, and provides for the observation and care of the patient during this time, is almost certain to be void of permanent results.

This is the era of preventative medicine and the old axiom that "An ounce of prevention is worth a pound of cure" is certainly true in drug addictions. It is the duty of every physician heartily to cooperate with the federal authorities to restrict the use of opium derivatives and cocain to their proper medical functions.

Inconsistency of English Antivivisection Law.—In England for years it has been necessary, if one wishes to perform a single vivisection experiment, to procure a license. It is much easier to get a license to run a low grogshop. Any man may without a license and with practically no regard for the sensations of the animals rip out the testes from a boar or a dog, merely because it suits his convenience or his whim or his purse to have his animals gelded; but if a physiologist wishes to make the same operation for the purpose of scientific observation on the effects of castration, he must secure a license stating with precision the building where this is to be done, and the purpose of the experiment, and he *must*, he has no option, perform the operation under complete anesthesia.—Samuel S. Maxwell, *Science*.

GOITER

AN ANALYSIS OF ONE HUNDRED AND THIRTY-SEVEN CASES *

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In assisting in the preparation of the recent medical and surgical report of the Roosevelt Hospital, I reviewed the results of the work which the surgical staff of that institution has done on goiters for the five years ending Jan. 1, 1915. Work which I myself had done in other institutions was included in this report. Since January 1, operation has been performed in seventeen additional cases in the Roosevelt Hospital by the members of the surgical staff. This makes a group of 137 cases for our study. The hospital report was largely statistical, and this study is made to call attention to certain elements not included in it, and to add the results of this year's observations.

Before attempting to make deductions from these cases, it is necessary to indicate the different types of goiter for which operation has been done:

1. Goiters which annoy simply by their mechanical presence, causing pressure symptoms or deformity or both but not giving toxic symptoms.
2. Goiters which give toxic symptoms.
3. Goiters which show malignant disease.

NONTOXIC GOITERS

Sixty-three patients are included in this group. If the histories of these patients were to be taken in the light of our present knowledge, I believe the group would be smaller; among the more recent patients we frequently find that those who at first complain only of uncomfortable lumps in their necks really also have "nervousness," irritability, increased heart action and undue fatigue, and that these symptoms disappear after operation. Such cases would now be classified as mildly toxic. Since these early histories cannot be rewritten, we must adhere to the classification already given and consider the type of operation and the results. These seem to be about the same whether we consider the cases nontoxic or mildly toxic.

The operative procedure for these patients is given in Table 1.

Enucleation of cystic or colloid nodules is the operation of choice for these patients. This is practicable only when globular masses exist which can be shelled

TABLE 1.—OPERATIVE PROCEDURES ON PATIENTS WITH NONTOXIC GOITERS.

Operations	Number
Enucleation of cystic or colloid nodules.	28
Hemithyroidectomy	25
Hemithyroidectomy and partial excision of remaining lobe	10

out of their beds without undue hemorrhage. The other operations are slightly more difficult, but give similar results. There was no operative mortality in the entire group, and there were no serious complications. The average detention in the hospital after operation was eleven days. This period could have been shortened, but the value of rest as a part of the after-treatment has been appreciated.

The later histories of these patients were extremely satisfactory; we were able to trace fifty-five of them for periods varying from nine years to six months. Four others made good operative recoveries, but have not yet been out of the hospital six months. All but

* Read before The Bridgeport Medical Society, Oct. 5, 1915.

one have remained well so far as the local condition is concerned, none have developed toxic symptoms, and there has been no recurrence of cysts. One patient had a part of the remaining lobe removed eight years after a hemithyroidectomy; it had slightly increased in size. In this group there were several women who for years had endured the deformity and discomfort of large goiters under the belief that they could not be removed. When they left the hospital ten or eleven days after their operations, freed of deformity and discomfort, their delight can well be understood.

TOXIC CASES

Sixty-eight patients are included in this group. These patients showed symptoms believed to be largely due to overacting thyroid glands. Loss of strength is probably the most constant of these symptoms. Increased heart action, restlessness, lack of mental "poise," tremor, digestive disturbances, insomnia, loss of weight, diaphoresis and exophthalmos are other symptoms.

Thirty-six patients showed some of the symptoms in moderate degree.

Thirty-two patients showed some or all of them in extreme degree.

The immediate results of operation on the patients in the first division of this group, those who showed the symptoms in moderate degree, were almost as good as those in the nontoxic group. The operations for these thirty-six mildly toxic patients are given in Table 2.

There was no mortality from operation, and there were no serious complications. Recuperation, however, was not quite so prompt, nor could it be expected with the same confidence as in the nontoxic cases. Those who had long-standing goiters showed quicker and better recovery than those whose toxic symptoms came early in their thyroid enlargement. Thirty-one of these thirty-six mildly toxic patients have been followed for periods varying from four months to twelve years. Twenty-six of them were reported in excellent condition and attending to their ordinary duties. Four had shown improvement but became easily tired and had to proceed with care. One had shown much improvement of goiter symptoms, but suffered from associated pituitary disease. The five who were not traced were in excellent condition on leaving the hospital.

In studying the results of operation in the nontoxic and mildly toxic cases, one must be impressed with their value. It would be difficult to find a group of patients who show more satisfactory results from any form of operative procedure.

TABLE 2.—OPERATIVE PROCEDURES ON PATIENTS WITH MILDLY TOXIC GOITERS.

Operations	Number
Hemithyroidectomy	26
Ligation of superior thyroid arteries	4
Artery ligation and subsequent hemithyroidectomy	2
Excision of parts of both lobes	2
Nodule enucleation	1
Boiling water injection	1

The thirty-one patients who showed symptoms of exophthalmic goiter in extreme degree presented the most difficult problems. These extreme cases are seen each year in smaller proportion; improved diagnosis and early treatment usually lead to their relief before the extreme stages of the disease are reached. But during the period which this study covers, some very desperate cases were treated. Patients are often sent into the general service of large metropolitan hospitals after long periods of neglect or after various forms of treatment have proved futile, and in trying to help these forlorn persons, surgeons are apt to accept some very undesirable surgical tasks.

The operations done in this group are given in Table 3.

There were six deaths among these patients. As noted earlier, there was no death rate in the previous groups, and in this group this rate could have been reduced almost or quite to zero by refusal to accept the extremely toxic cases. Had this been done, however, some very gratifying good results would have been missed. Three of the fatalities resulted from attempts to ligate the superior thyroid arteries. The patients were too ill to attempt more, yet one of them died on the operating table, and the others two days after operation. It is probable that enlargement of the thymus was a factor in these deaths. Garré estimates that 95 per cent. of the operative fatalities in exophthalmic goiter are due to this cause, and Kocher has seen five patients die suddenly the first few days after operation from persistent thymus.

TABLE 3.—OPERATIVE PROCEDURES ON PATIENTS IN ADVANCED STAGES OF EXOPHTHALMIC GOITER

Operations	Number
Hemithyroidectomy	22
Ligation of one or more thyroid arteries	7
Artery ligation and subsequent hemithyroidectomy	3

Of the three deaths which followed hemithyroidectomy, one came from edema of the lungs and one from pneumonia, each two days after operation; the third came eighteen days after operation with symptoms of profound psychic disturbance. It is believed that these patients had progressed to the stage of degeneration of the internal organs.

The results in the remaining patients of this group were very encouraging. Twenty-three have been traced for periods varying from six months to eight years. Thirteen have showed very great improvement, and ten moderate improvement.

Two others were followed two months, one with marked improvement and the other with very slight improvement.

One who was discharged from the hospital "improved" could not be traced afterward.

Many details concerning this group of patients are given in the hospital report previously referred to.

If we study the entire toxic group, including both severe and mild cases, we find that fifty-four patients have been traced long enough to be of value in estimating late results. Thirty-eight, or 70.4 per cent., have shown great improvement; fifteen, or 27.7 per cent., have shown moderate improvement, and one, or 1.8 per cent., has shown no noteworthy improvement.

In comparison, these results are apparently about the same as those reported by other observers. It is difficult for surgeons to learn the real postoperative results in large groups of patients, and the published reports cannot always be definite.

Küttner[1] examined the end-results in eighty-five cases of exophthalmic goiter, some treated medically, the rest surgically. Of twenty-one treated medically, five patients are dead, nine cases are notably aggravated, six are stationary, and only one patient is capable of working.

1. Küttner: Verhandl. d. deutsch. Gesellsch. f. Chir., 1911; Murphy's Year Book, 1912.

Of the patients treated by successful operation, 69.6 per cent., after periods up to eighteen years, are capable of earning their living; 33.6 per cent. are completely cured; 36 per cent. are much improved; 16.6 per cent. are improved; 13.8 per cent., including two insufficient operations, are not cured.

Garré[2] has been able to trace most of the patients on whom he operated. In 20 per cent. the exophthalmos had not disappeared. In 10 per cent. the tachycardia persists. The rest have been completely cured.

Berry,[3] in reporting on 346 cases of various forms of goiter says, "The vast majority of the patients made excellent and rapid recoveries and were completely freed from their symptoms."

Mayo,[4] in reporting on the results of operations in over 1,100 cases of hyperthyroidism, says, "About 70 per cent. of the patients consider themselves cured and apparently they are well." The others are improved but not well.

Rogers,[5] speaking of exophthalmic goiter, says that 40 per cent. are cured by ligation of three arteries, 60 per cent. by hemithyroidectomy, and 75 per cent. by ligation of four arteries.

GOITERS WHICH SHOWED EVIDENCE OF MALIGNANT DISEASE

There were six patients in this group, four with carcinoma, one with papillary cyst adenoma and marked induration of the surrounding tissues, and one with endothelioma. Three of the carcinoma patients died after various periods, and the postoperative history of the fourth could not be obtained. The patient with papillary cyst adenoma made a slow recovery from an incomplete operation, but was well two years later. The patient with endothelioma seemed well four years after operation.

CONCLUSIONS

This study has been carried on in a search for the best method of dealing with goiters. The following deductions seem to be fair:

1. For nontoxic patients who suffer from pressure symptoms or from neck deformity, cyst enucleation or partial thyroidectomy are extremely satisfactory procedures. The symptoms are relieved, and the likelihood of later toxicity is almost abolished.

2. For mildly toxic patients, operation is also very satisfactory. When the toxic symptoms develop in connection with preexisting goiter, cure is almost certain. When they develop in the early stages of thyroid hyperplasia cure is usually obtained, but cannot be expected with the same confidence. The operation may be by partial thyroidectomy, cyst enucleation, artery ligation or boiling water injection, according to the peculiarities of the case.

3. The patients with advanced exophthalmic goiter present the most difficult problems. For their successful treatment many elements must be considered, including the complex nature of the ductless glands, their interdependence on each other and on nervous and chemical influences from other parts of the body, and the various therapeutic measures which interrupt this vicious chain of disturbance.

The hyperplastic thyroid gland seems to be the cause of many of the symptoms, and it is the organ most easily attacked in our effort to control these symptoms. The treatment consists largely in endeavor to control its overactivity.

Rest is an important element in this treatment.

The injection of boiling water (Porter) has an undoubted influence, and can be used for patients too ill for more radical measures.

The ligation of the thyroid arteries is often very beneficial, and can be used in preparing patients for hemithyroidectomy or as a substitute for that procedure.

The excision of a part of the thyroid gland has been followed by so many satisfactory results that it must be considered our most reliable therapeutic measure.

The administration of drugs and animal extracts, and the use of the Roentgen ray may be beneficial.

The choice of these procedures should depend on the condition of the patient. If that choice is judicious, nearly all of these patients can be brought to a condition of marked improvement.

2. Garré: Verhandl. d. deutsch. Gesellsch. f. Chir., 1911; Murphy's Year Book, 1912.
3. Berry, J. H.: Lancet, London, March 15, 1913.
4. Mayo, C. H.: Med. Rec., New York, Dec. 31, 1910.
5. Rogers, John: Paper read before New York Surg. Soc., Jan. 15, 1915, and personal communication to the author.

NEEDLESS SURGICAL OPERATIONS FROM FAILURE TO RECOGNIZE TABES DORSALIS

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Within the past few years several writers, among them Cabot,[1] Hall[2] and Cheney[3] in this country, and König,[4] Lomnitz[5] and others in Europe, have directed attention to operations for supposedly local disease of the abdomen in patients with tabes in whom no disease was found at the laparotomy. Careful search through the literature fails to reveal more than casual reference to the frequency of such blunders. Surgeons performing laparotomies frequently are fully acquainted with this danger, but it is believed that the following study may stimulate still greater caution.

In the past five years (1910-1915) over 1,000 cases of tabes dorsalis have been carefully studied in the Cook County Hospital on the neurologic services of Drs. Hall, Grinker, Hassin, Hamill and Kuh. These records have been examined to determine the relative frequency of the cardinal symptoms, the number of patients operated on, the frequency of gastric crises, etc. In estimating the number of operations, only those have been included in which the patient was told by the surgeon that nothing wrong was found, and in which the old symptoms returned following the operation. Cases have been excluded when scars of previous operations were found in the epigastrium, kidney or appendix regions with no record of what was found or done at the operation recorded on the history sheets, or when this could not be learned from the surgeon. Obviously some of the latter deserve recognition, as all these patients at the time of admission to the hospital exhibited several or many of the important symptoms of tabes. It is believed, however, that this error is not a great one.

1. Cabot, R. C.: Differential Diagnosis, Philadelphia, 1914, ii, 229, 230.
2. Hall, G. W.: Tabes and the Surgeon, Ill. Med. Jour., 1910, xviii, 527.
3. Cheney, W. F.: Gastric Disturbances in Tabes Dorsalis, Am. Jour. Med. Sc., 1913, cxlv, 328.
4. König: Tabische Krisen, Deutsch. med. Wchnschr., 1911, xxxvii, 2357.
5. Lomnitz, quoted by K. Singer: Die Krisen der Tabiker, Berl. klin. Wchnschr., 1911, xlviii, 2168.

Of 1,000 patients with tabes, only five had operations in the Cook County Hospital during the past five years (1910-1915). About 200 tabetics are admitted to this institution annually, and there are approximately 2,400 major surgical operations performed here each year. Regarding the remainder of those operated on, it was learned that in ten different hospitals, widely separated from each other and naturally with great variations in size and experience of the surgeons, there were twenty operations on tabetics under mistaken diagnoses in approximately the past four years.

It is clear that the mistake is not confined to any special locality. Furthermore, if was learned that such operations are fewer in the larger hospitals, such as the Cook County Hospital, than in the smaller hospitals throughout the United States.

The following are what have been apparently surgical errors: Ninety-seven operations have been performed on 87 patients. Of the total number, there were 19 operations on 18 patients for gastric ulcer; 19 operations on 16 patients for gallstones or cholecystitis; 18 operations on 17 patients for appendicitis; 11 patients were operated on 13 times for salpingitis; on 9 patients an exploratory laparotomy was made; 7 operations were performed on 6 patients for renal calculi; 7 operations on 5 patients for postoperative adhesions, and 1 operation for each of the following: tumor of the cauda equina, sciatica (nerve stretching), meningocele, ectopic gestation and peritonitis. (See the accompanying tabulation.)

Of 1,000 tabetics, 8.7 per cent. have been subjected to laparotomy under mistaken diagnoses one or more times. Furthermore, gastric ulcer was the diagnosis most frequently made, and next gallbladder disease, with appendicitis a close third. As regards operations for postoperative adhesions, there were seven on five patients. One patient had five laparotomies, the last three for postoperative adhesions, and following each operation the old symptoms of epigastric pain with severe vomiting returned, that is, the gastric crises of tabes.

USELESS SURGICAL OPERATIONS IN ONE THOUSAND CASES OF TABES DORSALIS

Surgeon's Diagnosis	No. of Operations
Gastric ulcer	19
Gallstones or cholecystitis	19
Appendicitis	18
Salpingitis	13
Exploratory laparotomy	9
Renal calculi	7
Postoperative adhesions	7
Tumor of cauda equina	1
Sciatica (nerve stretching)	1
Meningocele	1
Ectopic gestation	1
Peritonitis	1
Total number of operations	97 (9.7%)

In Chart 1 is shown the relative frequency of the important symptoms; altered pupillary reactions in 800 patients; lancinating pains, usually early in the disease, in 740; loss of the patellar reflexes or of the Achilles jerks or both in 700, etc. It is of interest that visceral crises were observed in 22 per cent. of all the patients, that is, 19 per cent. of the gastric type, 2 renal, and 1 per cent. intestinal crises.

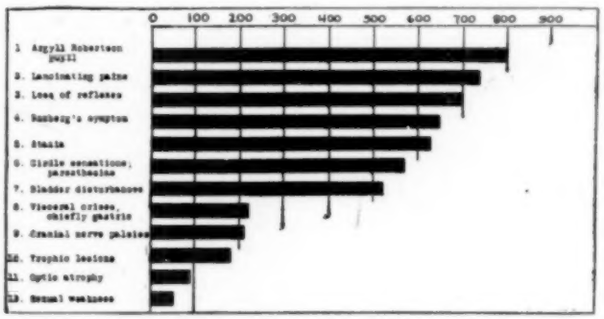

Chart 1.—Relative frequency of the cardinal symptoms in 1,000 cases of tabes dorsalis; thus, 800 patients presented Argyll Robertson pupils, 740 lightning pains, etc. Note that the visceral crises were present in 22 per cent.

In the report by Schaffer[6] regarding the symptoms in tabetics, the following are given in order of frequency: pupillary symptoms; lancinating pains; Westphal's sign (loss of patellar reflexes); Romberg's symptom, and urinary disturbances.

In Chart 2 the relative frequency of the symptoms included in the previous chart are contrasted with those in the eighty-seven patients operated on, the light line representing the eighty-seven patients operated on, the dark line the incidence indicated in Chart 2, here reduced to a curve.

From consideration of this chart it is evident that in 65 per cent. of the 87 patients operated on, the "crises" must have largely influenced the decision to operate, for in the entire series, visceral crises were observed only in 220 patients, or 22 per cent. This supposition is also supported by statements that the *initial* symptoms leading to the ninety-seven operations were gastric crises in 17 per cent. Friedenwald[7] found the gastric crises occurring as the initial symptom of tabes but five times in forty-two cases, and, according to this writer, Erb found them ten times in 400 cases, and Fournier fifteen times in 211 cases.

The following brief summaries of case histories are introduced to illustrate how the data used in the charts have been arrived at and also how great the importance attached to early symptoms of "crises" has been in determining operation.

CASE 1.—L. K., woman, aged 46, housewife, when admitted complained of paroxysmal attacks of intense abdominal pain, vomiting and diarrhea for twenty years. Twenty years ago she had a right cystic ovary removed. No relief followed the operation. One year later her appendix was taken out. Following this all of her former symptoms returned. During the next ten years she had three operations for postoperative adhesions. She entered the hospital with her original complaint.

Physical examination revealed a poorly nourished individual who appeared acutely ill, sclerae icteric, lips cyanotic, bilateral ptosis, both pupils slightly irregular and not reacting to light. There was a generalized abdominal tenderness but no definite rigidity. There were multiple abdominal scars of previous laparotomies. All the normal reflexes were active and readily elicited, except the Achilles jerks, which were sluggish. There was a transverse band hypalgesia about the chest. No Romberg's symptom and no ataxia were present. Lumbar puncture revealed a clear fluid under normal pressure. Nonne negative. Cell count showed 15 small mononuclear lymphocytes per cubic millimeter.

Here the initial symptoms were a combination of gastric and intestinal crises. The first operation, said to have been for a cystic ovary, may possibly have revealed gonorrheal salpingitis, and has not been enumerated in the charts or other statistics. That the

6. Schaffer, Karl: Tabes Dorsalis, Handbuch der Neurologie von Lewandowsky, Berlin, 1911, ii, 1037-1038.
7. Friedenwald, J., and Leitz: The Gastric Crises of Tabes, New York Med. Jour., 1912, xcvi, 13.

appendectomy was truly indicated cannot be determined. Whether the three successive laparotomies were made for troubles which the surgeon, previous to operation, believed due to postoperative adhesions, or whether the conclusions were arrived at subsequent to the operations cannot be determined from the records.

CASE 2.—M. C., aged 49, married, a traveling man, entered the Cook County Hospital, May 8, 1915, complaining of paroxysmal attacks of nausea and vomiting, epigastric pain and weakness. The vomiting bore no relation to food taking, and often appeared suddenly in the middle of the night. Attacks lasted from two to three days, and disappeared suddenly. In 1908 the patient was operated on for gastric ulcer, but nothing abnormal was found. In 1912 he was operated on for gallbladder trouble, and a cholecystotomy was done. This gave him no relief, and with the return of his old symptoms the patient submitted to a second operation on his stomach for postoperative adhesions. He has since developed a postoperative hernia the size of a hen's egg at the site of the last operative scar. He is now a morphin habitué.

Physical examination revealed ptosis of the right upper eyelid. The right eyebrow arched upward more than the left. The wrinkles on the right side of the forehead were deeper than on the left, that is, there was compensatory overaction of the right occipitofrontalis muscle. The pupils were oval, irregular in outline, and unequal in size. Reaction was very sluggish to light. There was marked ulnar analgesia. Hyperalgesia was present over the thighs anteriorly. There was a slight degree of ataxia. Romberg's symptom was suggestive. There was paroxysmal incontinence of urine. The plantar, Achilles, triceps and other reflexes were all readily elicited. The patient left the hospital before an analysis of the spinal fluid could be made.

This also serves to illustrate the onset of tabes with typical gastric crises. After fifteen years of the disease, the plantar and Achilles reflexes are still active.

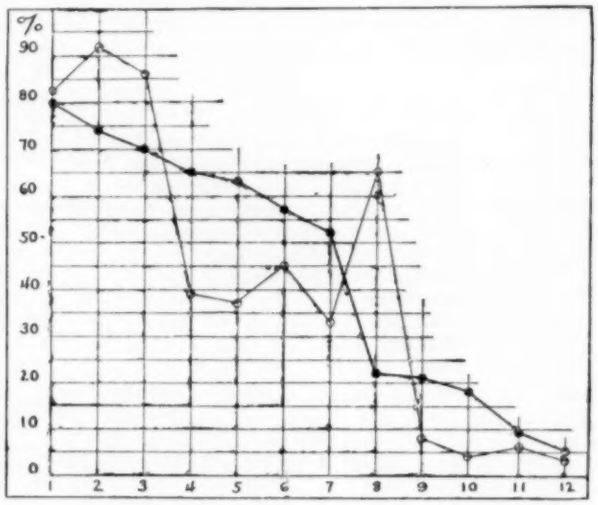

Chart 2.—Frequency of cardinal symptoms; the ordinates represent the cardinal symptoms in the following order: 1, Argyll Robertson pupil; 2, lightning pains; 3, loss of reflexes; 4, Romberg's symptom; 5, ataxia; 6, paresthesia; 7, bladder disturbances; 8, visceral crises; 9, cranial nerve palsies, diplopia, strabismus, etc.; 10, trophic lesions; 11, optic atrophy, and 12, sexual weakness. The light line represents the eighty-seven tabetics operated on, the heavy dark line the incidence indicated in Chart 1, but here reduced to a curve. Note that the crises (Ordinate 8) were present in 65 per cent. of the patients operated on as contrasted with but 22 per cent. in the series of 1,000 cases.

CASE 3.—J. H., man, aged 50, druggist, entered the hospital complaining of pain in the left leg present for the past fifteen years. Beginning in the left hip, these pains radiated down the leg into the foot, and at times were constant, severe and sharp. There was impaired sensation over the outer surface of the left lower extremity. The patient stated that one year before he lost the sensations of pain and touch in this limb; he could stick needles into the leg without feeling it. He has been taking morphin sulphate, 1 grain per dose, to relieve these pains.

Physical examination revealed an emaciated, elderly man of medium stature. The pupils reacted to light and accommodation. The heart, abdomen and genitalia were negative. There was a trophic ulcer present at the base of the left great toe. The patellar and Achilles reflexes were absent. Pain sensation was greatly diminished over the lower left leg laterally. No pain was elicited on pressure over the sciatic nerve.

The patient was transferred from the neurologic service with the diagnosis of tumor of the cauda equina, for surgical treatment. The operation as recorded on the history sheet follows:

"Longitudinal incision over spinous processes in lumbar region, down to vertebrae.

"*Pathology.*—Chronic pachymeningitis, with areas of hemorrhagic character, and adhesions between cord and meninges posteriorly. Cord has dark spotted appearance, like old hemorrhages.

"*Technic.*—Opening and closing spinal canal by laminectomy. Opening dura and closure with catgut. Clearing adhesions with probe."

During the operation the condition was recognized as tabes. Death occurred three weeks later. No postmortem examination was made.

Over forty-seven years have passed since Charcot[8] described the gastric crises in tabes. His work forms the basis of all our knowledge regarding them, and relatively little additional information concerning them has been learned; his account is worthy of repetition:

> But of all the visceral symptoms which may display themselves from the period of lightning pains, one which is at once the most remarkable and the least known, if I mistake not, is that which I have proposed to designate by the name of gastric crises. . . . Very often, their real signification remaining misunderstood, they are the occasion of grave errors of diagnosis.
>
> But it is time to tell you in what these gastric crises consist. Suddenly and generally at a period when a paroxysm of shooting pains has seized upon the extremities, the patient complains of pains which, starting from the groins, seem to ascend both sides of the abdomen and to fix themselves in the epigastric region. At the same time they complain of pains situated between the shoulders which radiate around the base of the trunk in a lightning-like manner. Then the pulsation of the heart commonly becomes violent and precipitated. . . . Frequency of the pulse without fever is in truth a very common incident. . . . Almost incessant and extremely distressing vomiting is often associated with gastric crises. Food is first ejected and then a mucous colorless liquid sometimes mixed with bile or tinged with blood. An intense feeling of sickness and vertigoes are superadded to the vomiting and cardialgic pains. . . . Many a time I have seen this symptom diverting the attention of the physician and causing him to misapprehend the real nature of the disorder. I also have several times fallen into the snare in other days.

A number of writers have adopted the classification of the gastric crises attributed to Fournier. He divided them into the following types:

1. The *grand crise gastrique,* in which there is extreme epigastric pain, retching and vomiting, followed often by general prostration. This is the most common form.

8. Charcot: Lectures on Diseases of the Nervous System, New Sydenham Soc. Pub., 1881, xc, 29.

2. Crises with vomiting alone.
3. Crises with pain alone.
4. Crises in which there may be only loss of the appetite.

That they may and do occur as the initial symptoms of tabes must be remembered. Their average duration varies from one to three days; they may drag on for several weeks with the ultimate exhaustion of the patient. The sudden onset and abrupt termination is quite typical of them. During the intervals between the attacks, the stomach functions in a normal way. During the attacks the pulse rate is accelerated (from 90 to 100) while the temperature usually remains normal.

Stomach analysis of the vomitus and of the gastric secretions during the crises fails to reveal anything characteristic. Bile-stained mucus with hyperacidity, hypacidity, and even achylia have been found.

The blood pressure is raised during the crises. Thus Barker[9] reports a blood pressure ranging between 180 and 220 mm. Hg during a seven-day attack. He noted that with the fall of the blood pressure to normal, the attack promptly subsided. Accordingly nitrite medication as well as epinephrin chlorid during the crises gives relief.

From a study of the information presented in these charts, it is apparent that the mistaken diagnoses and resulting operations were chiefly in two main groups of patients.

1. Tabetics in whom the initial symptoms were the visceral crises and less frequently those with renal or intestinal crises.

2. Tabetics in the class designated by Erb as "tabes incompleta" or "formes frustes" by the French. These patients presented fewer of the characteristic symptoms of tabes, and the mistakes leading to operations are less surprising.

From studying these records it has seemed that the mistakes made have been not so much the result of clinical ignorance as of superficial examination and the failure to consider tabes: furthermore, there would seem to be little excuse for such failures when patients present themselves for examination with a history of pain in the stomach, vomiting, rheumatism, paresthesias, arthropathies, bladder disturbances, or fractures without physical violence.

In studying these records the possibility of bona fide abdominal disease developing in tabetics has been constantly in mind. An example of this follows:

CASE 4.—J. G., man, aged 53 (?), a laborer, was admitted to the hospital complaining of general weakness, failing vision, anorexia and ataxia.

Physical examination revealed a feeble old man, poorly nourished, and taking but little interest in his surroundings. The right eye was missing. The left pupil did not react to light, and only sluggishly to accommodation. There was no abdominal tenderness or rigidity. The patellar reflexes and Achilles jerks were absent. Paresthesias were present.

The patient was admitted to the neurologic service with the diagnosis of tabes. There was sudden onset of intense epigastric pain. The pulse became rapid and thready, the face cyanotic, respirations shallow and labored, temperature subnormal, and death occurred five hours after admission.

Dr. LeCount made the following anatomic diagnosis:

"Perforating peptic ulcer of the duodenum; fibrinopurulent peritonitis; edema of the mediastinal tissues and of both lungs; subcapsular petechial hemorrhages of the liver; healed encapsulated caseous tuberculosis of the left lung; tuberculous osteomyelitis of the ribs; moderate kyphosis; moderate hyperplasia of the biliary, mesenteric and tracheobronchial lymphgland; adventitious fibrous adhesions between the lungs and chest wall; syphilitic nodular sclerosis of the aorta; gummatous scars in the leptomeninges; copper-colored scars over the left tibia; marked chronic diffuse nephritis—secondarily contracted kidneys; marked hypertrophy of the left ventricle of the heart; numerous absent teeth—caries; old healed scars of the left temple; infantile cecum; persistent membranous eustachian valve; postmortem digestion of the lining of the esophagus." The spinal cord was not examined.

Other patients with tabes were operated on for hernia, many were treated for fractures; some patients with tabes had gallstones removed according to the records, others stones from the kidney. None of these, as previously stated, have been included in the unnecessary operations.

Recently, we have received a very promising aid to the early diagnosis of tabes in the so-called cytodiagnosis of the spinal fluid. "Marked lymphocytosis appears to occur even in the earliest stages of tabes."[10] A positive Wassermann reaction with the spinal fluid is of great value in doubtful cases.

As Cabot[11] has stated:

> What we are learning in the last few years, since lumbar puncture and Wassermann reactions in the blood and spinal fluid have become matters of routine in doubtful gastric cases, is that any type of stomach trouble, acute or chronic, mild or severe, sharply painful or merely distressing, may be due to cerebrospinal syphilis. Until within the past few years, one was on the lookout, if he were conscientious, for so-called gastric crises in tabes. What we have learned lately is:
>
> (*a*) That we must suspect the possibility of tabes even when the pupils are normal, and must investigate this possibility by means of spinal puncture.
>
> (*b*) That any sort of gastric abdominal pain or distress may be due to tabes.

It is believed that with a careful examination to exclude tabes, in the future more tabetics will be spared useless surgical operations, and more acute abdominal symptoms will be proved of spinal origin.

CONCLUSIONS

1. Of 1,000 tabetics, 8.7 per cent. have been subjected to laparotomy under mistaken diagnosis one or more times.

2. The "crises" of tabes have largely influenced the surgeon in his decision to operate. This statement is supported by the fact that 65 per cent. of the eighty-seven patients operated on presented visceral crises. In 17 per cent of these, the "crises" were the *initial symptoms* of their disease.

3. Mistaken diagnoses and resulting operations occur chiefly through failure to examine the nervous system.

4. Gastric ulcer, gallbladder disease and appendicitis are the diagnoses most frequently made.

5. Tabetics subjected to several successive laparotomies have, as a rule, been operated on by as many different surgeons.

6. A history of paroxysmal attacks of vomiting, rheumatism, paresthesias, bladder disturbances or fractures without physical violence should excite interest to exclude tabes dorsalis.

7. The cytodiagnosis of the cerebrospinal fluid, together with the Wassermann reaction with the spinal fluid, are of intestimable value in doubtful cases.

9. Barker, L. F.: Paroxysmal Arteriospasm with Hypertension in the Gastric Crises of Tabes, Am. Jour. Med. Sc., 1910, cxxxix, 631.

10. Erb, Wilhelm: Tabes Dorsalis, Modern Clinical Medicine (Church's Translation), 1911, p. 528.

11. Cabot, R. C.: Differential Diagnosis, p. 256.

THE THERAPEUTIC VALUE OF THE HYPOPHOSPHITES *

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It may be stated, almost as an axiom, that a drug, in order to be useful, must, in general, do one of three things: It must produce either a local or general physiologic effect, it must exert a specific demonstrable influence on pathologic processes, or it must have a "food" value.

Hypophosphites, used for years in medicine, were first introduced as a cure for pulmonary tuberculosis. They have since been recommended as exerting varied physiologic actions, and their use at present is based mostly on the assumption that the hypophosphites are "foods."

At the request of the Council on Pharmacy and Chemistry of the American Medical Association, the evidence for and against the value of hypophosphites in each of these directions has been critically examined, and experiments have been carried out, the latter being especially designed to determine the "food" value. The investigation reveals that the evidence against the usefulness of hypophosphites is overwhelming.

The hypophosphites were introduced into medicine in 1858 by J. F. Churchill[1] as the result of a physiologic misconception. In that year he published his book on the treatment of pulmonary tuberculosis, in which he assumed that the "tuberculous diathesis" depended on a disturbance in the balance of various substances in the organism, and that the disturbance must be in the inorganic elements of the blood. He argued that, as iron, chlorids, sulphur and the alkalies had all been used without success in the treatment of tuberculosis, they were not the essential substances involved. Taking his cue from the discovery that had been recently announced of phosphorus in the blood, he assumed that phosphorus was the lacking element. He concluded that the element phosphorus was not well suited for administration on account of its toxicity and rapid deterioration, and that phosphorus in the fully oxidized form of phosphates was also unsuited as it was not "combustible." Hence, he selected the hypophosphites as being a form of phosphorus nontoxic and yet capable of further oxidation in the organism. He stated categorically that *"the tuberculous diathesis depends on a diminution in the element phosphorus and that this element, having to play the rôle of a combustible body, must be administered in a less completely oxidized form than that of phosphoric acid."* [2]

Churchill administered hypophosphites to about thirty patients whom he had diagnosed as tuberculous. Nine of these patients he claimed to have completely cured, ten showed clinical improvement, the remainder died. A critical examination of the histories of the "cured" patients would lead one to suspect that some cases were pneumonia in which the "cure" occurred at crisis, others malaria and others perhaps tuberculosis in which improvement had occurred, due to the general hygienic measures that were instituted. The author mentions that he lost sight of many of the cases, so that we are left quite in the dark as to the ultimate developments. It is not remarkable that many of the patients treated should have felt better for a time. The hopefulness of consumptives is well known. Churchill claimed that hypophosphites did more than merely cure tuberculosis. To his mind they acted as hematinics. He even claimed that in some of his patients the production of new blood was so great that they suffered from hemorrhages from the nose and from hemorrhoids. He went further: He claimed a general tonic effect. Some of his patients grew heavy beards in an incredibly short time; others cut wisdom teeth with astonishing rapidity, following the administrations of the drug. The bedridden rose and walked.

From all accounts, the medical men of Churchill's day received his reports with much incredulity, and even derision. A number of investigators, evidently taking the matter more seriously, administered hypophosphites to tuberculous patients with the result that many unfavorable reports quickly made their appearance.

Dechambre[3] concluded that the hypophosphites were not to be considered at all as specifics in the treatment of phthisis.

Trousseau and Vigla[4] emphasized the insignificance of the results obtained by hypophosphite medication.

Quain,[5] reporting cases from his clinic at the Brompton Hospital, stated that he was unable to obtain any of the physiologic effects claimed by Churchill, and, further, that the hypophosphites had no favorable action on the course of pulmonary tuberculosis.

Pidoux[6] denied the efficacy of hypophosphites as far as the tuberculous process was concerned, but suggested that they might be useful in supplying necessary elements for the repair of tissues.

Madden[7] recommended the syrup of hypophosphites of iron, soda, potash and lime, combined with other drugs, as useful in the wasting occurring in tuberculous infections in young subjects, but mentioned the fact that hypophosphites were not as generally beneficial as Irish moss! He submitted no definite evidence in support of his views.

Rabuteau[8] administered 3 grains of sodium hypophosphite daily to a healthy woman and observed an acceleration of the pulse, an elevation of the temperature and a beginning plethora, as indicated by an increased color in the face and lips. There was also an increase in the quantity of urine. With no more evidence than this the author concluded that part of the ingested phosphorus was eliminated, another part was oxidized to supply the phosphorus-containing elements in the organism, and a third part stimulated the formation of red blood cells. The work of this author is quoted as an example of the insufficient evidence on which the whole hypophosphite theory rests.

Paquelin and Joly,[9] endeavoring to test out the theory that hypophosphites were utilized in the organism, collected the urine from patients after the administration of hypophosphites, and claimed to have recovered the entire amount ingested. The only effect that they

* From the Harriet Lane Home and Department of Pediatrics, Johns Hopkins University. Work undertaken at the request of the Council on Pharmacy and Chemistry, and aided by a grant from the American Medical Association.

1. Churchill, J. Francis: De la cause immédiate et du traitement spécifique de la phthisie pulmonaire et des maladies tuberculeuses, Paris, 1858.
2. ". . . que la diathèse tuberculeuse dépendait d'une diminution dans l'économie de l'élément phosphoré, et que cet élément, ayant à jouer le rôle d'un corps combustible, devait s'y trouver à un degré d'oxydation inférieur à celui de l'acide phosphorique."
3. Dechambre: Gaz. hebd. de méd., 1858.
4. Trousseau and Vigla: Jour. de chem. et de Pharm., Paris, 1858.
5. Quain: Bull. gén. de thérap. méd. et chir., 1860, lviii.
6. Pidoux: Union méd., Paris, 1869, vii.
7. Madden, in Keating's Cyclopaedia of Diseases of Children, 1890, i, 405.
8. Rabuteau: Elements de therapeutique et de pharmacie, Paris, 1872.
9. Paquelin and Joly: Compt. rend. Acad. d. sc., 1878, lxxxvi.

noted following the administration of the hypophosphites was a diuresis.

Vermeulen[10] administered sodium hypophosphite to normal individuals, to tuberculous subjects, to dogs and to rabbits, and concluded that hypophosphites were rapidly eliminated totally and without alteration in the urine. He could not see in any of the subjects any change due to the administration of the drug, with the exception that in some instances large doses of hypophosphites seemed to change the respirations in the direction of shortening inspiration and prolonging expiration. No figures or tracings are given by the author in support of this view.

Boddaert[11] administered hypophosphites to man, to dogs and to rabbits, and recovered 95 per cent. in the urine within twenty-four hours. He noted a diuretic effect. The work of Massol and Gamel,[12] of Panzer[13] and of Delaini[14] confirmed that of Boddaert.

Berg[15] found that in man, ingested hypophosphites were excreted largely unchanged, and at the same time the elimination of phosphates was slightly increased. He concluded that the hypophosphites were in small part oxidized to phosphates, but that none of the phosphorus was retained, and that, as a means of administration of phosphorus, the hypophosphites were entirely useless.

Patta[16] alone found that any considerable amount of ingested sodium hypophosphite was retained in the body. This author injected sodium hypophosphite into dogs and rabbits, and recovered only about 50 per cent. in the urine in twenty-four hours, and concluded that the remainder was utilized. The results obtained by this author are not to be considered in any way trustworthy, as he used a method which is now known to give inaccurate results, and in addition obviously made a mistake in his calculations of results that would lead to a final error of 100 per cent., for he gives an incorrect chemical formula for the reactions involved.

Since the evidence as to the utilization of the hypophosphite has been to some extent contradictory, a series of experiments has been carried out by us in the endeavor to determine, by means of methods known to be correct, whether hypophosphites are or are not utilized in the body. Sodium hypophosphite (Hoffman-LaRoche Chemical Company) was used. This material was found, on analysis, to contain practically the theoretical amounts of hypophosphorous acid. Carefully measured portions of a 10 per cent. aqueous solution of this salt were taken by four normal men over a period of three days each. The solution was taken after the morning and noon meals and before the evening meal. Ten c.c., equivalent to 1 gm. of sodium hypophosphite, was taken at each dose. Twenty-four hour specimens of urine for periods beginning and ending at 7 a. m. were collected for the three days of the experiment and one day succeeding. The urine bottles were kept in an ice-box. No preservative was added.

This method of analysis depended on the oxidation of the hypophosphites to phosphates by means of potassium chlorate, nitric and hydrochloric acids, and the determination of the resulting phosphates by titration with uranium acetate solution. Before beginning the experiment, it was determined that normal urines, when treated according to the method adopted, showed the presence of no hypophosphite, and that on adding known amounts of hypophosphite to such urines the entire amount added was recovered. It was further determined that no error was introduced by allowing a urine containing hypophosphite to stand in the ice-box for forty-eight hours without added preservative.

None of the subjects of the experiment experienced any effect whatsoever from the administration of the drug. The results are summarized in the accompanying table, from which it is evident that almost all of the ingested hypophosphite is promptly eliminated unchanged. A small amount, however, is unaccounted for in the urine. This may have escaped absorption from the intestinal tract or else have been oxidized to phosphoric acid in the body. Considering the fact that hypophosphorous acid is readily oxidized even by such weak agents as mercuric chlorid at ordinary temperatures, it is not unlikely that a part was oxidized either in the intestinal tract or parenterally. If it was oxidized, the resulting phosphate could benefit the organism only to the same extent as ordinary phosphates, and the calories produced by the oxidation of such a small amount of material could be of no appreciable value to the body. Since hypophosphites do not occur in any organ of the body, so far as has ever been determined, there is no reason to suppose that ingested hypophosphites are stored as such or, if they are stored, that the organism would be at all benefited by the presence of such foreign substances.

It has been urged that the hypophosphites may be of benefit even if the hypophosphorous acid radical is not utilized. It is claimed that the administration of hypophosphites facilitates the absorption of calcium, since calcium hypophosphite is water-soluble, whereas cal-

SUMMARY OF RESULTS

SUBJECT H.

Day	Sodium Hypophosphite Intake	Output	Balance	
	gm.	gm.	gm.	
1	3.0	2.11	0.89	
2	3.0	2.56	0.44	
3	2.0	1.51	.49	
4	0.0	0.20	.20	
Total	8.0	6.38		80% eliminated

SUBJECT M.

Day	Sodium Hypophosphite Intake	Output	Balance	
	gm.	gm.	gm.	
1	3.0	2.18	0.82	
2	3.0	2.43	0.57	
3	3.0	2.48	0.60	
4	0.0	0.02	.02	
Total	9.0	7.11		79% eliminated

SUBJECT S.

Day	Sodium Hypophosphite Intake	Output	Balance	
	gm.	gm.	gm.	
1	3.0	2.68	.32	
2	3.0	2.66	.34	
3	3.0	2.52	.48	
4	0.0	0.00	.00	
Total	9.0	7.86		87.5% eliminated

SUBJECT G.

Day	Sodium Hypophosphite Intake	Output	Balance	
	gm.	gm.	gm.	
1	2.0	2.00	0	
2	3.0	2.46	.54	
3	3.0	2.85	.15	
4	0.0	0.00		
Total	8.0	7.31		91.5% eliminated

Total average eliminated, 86%

10. Vermeulen: Onderzoekingen omtrent de physiologische werken van het Natrium hypophosphiet, Amsterdam, L. Kervel, 1884.
11. Boddaert, A.: Contribution à l'étude de l'action des hypophosphites sur la nutrition, Arch. de pharmacodynam., 1895-1896, i, ii, 195.
12. Massol and Gamel: Bull. Acad. de méd. de Paris, Oct. 8, 1901; abstr., THE JOURNAL A. M. A., Nov. 16, 1901, p. 1353.
13. Panzer: Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, 1902, v, 11.
14. Delaini: Arch. d. fisiol., 1911, ix, 329.
15. Berg: Biochem. Ztschr., 1910, xxx, 107.
16. Patta, Aldo: Osservazioni intorno al comportamento degli ipofosfiti nell 'organismo, Arch. di farmacol. sper. e Sc., affini, 1910, ix, 1.

cium phosphate is practically insoluble. One could with equally good logic argue that, since calcium chlorid is soluble, the administration of sodium chlorid would increase calcium absorption; the fallacy is that, in the presence of phosphates or of other acid radicals capable of forming a nonsoluble compound with calcium, the nonsoluble compound would be formed, whether or not the calcium were originally in a soluble form.

It may still be claimed that hypophosphites influence nutrition in some occult way that cannot be definitely determined. Such claims may be made for any substance whatsoever and of course cannot be denied, but, in the absence of proof as to the value of the drug, we are not justified in using it merely because it "may do good." If such an attitude were generally taken, the complement of useless drugs in the pharmacopeia would be increased manyfold.

The investigations previously referred to in this paper have been carried out chiefly on man. In the instances in which experiments on animals were also performed, it was demonstrated that the lower animals react to hypophosphites in no way differently from man. We are, then, apparently justified in assuming that conclusions drawn from animal experimentation, so far as hypophosphites are concerned, are valid for men. Such being the case, the experiments of Forbes[17] and his associates at the Ohio Agricultural Experiment Station give most valuable information as to the real nutritive value of the hypophosphites. These experiments were performed on growing pigs, given diets containing an insufficient amount of phosphorus-containing compounds, the deficit being made up by the addition of phosphorus in the form of phosphates—glycerophosphates, hypophosphites, and nucleic acid—each lot of pigs receiving the phosphorus in one of the various forms mentioned. The authors concluded from the results of these experiments that, of the compounds of phosphorus tested, the hypophosphites possessed the lowest nutritive value.

The pigs receiving hypophosphites, either alone or with nucleic acid, "suffered from great weakness and lameness. They were more or less subject to indigestion. The legs were weak, especially the hind ones, which trembled and bowed out, and the feet were set far under the body. The fore feet were also sore. The muscular control was poor. The pigs lay down most of the time, and if disturbed would at once lie down again."

These pigs behaved very much as the pigs receiving no phosphorus supplement at all—in fact, the abnormal tendencies were less pronounced in the latter case. In contradistinction to these, the pigs receiving extra phosphorus in the form of phosphates or glycerophosphates were entirely normal.

At the conclusion of the experiments all of the animals were examined at necropsy. One very noticeable finding was that the breaking strength of the bones, accurately determined, was found to be very much less in the pigs fed on hypophosphites than in any other group. Further, chemical analysis of the bones of these animals demonstrated a diminished calcium and phosphate content; the total ash was also less.

These experiments demonstrate conclusively that the hypophosphites possess no specific value as a source of phosphorus for the body. This is not to be wondered at in view of the fact that 85 per cent. of the phosphorus ingested in the form of hypophosphite is excreted unchanged, and there is no proof that even the remaining 15 per cent. is available to the organism. It is doubtful if there are any conditions in which the body suffers from lack of phosphorus. Even should such conditions exist, phosphorus, in the form that it occurs in the ordinary foods or as phosphates, is more efficient in supplying the deficit than hypophosphites that must be oxidized before utilization and which are only about 15 per cent. oxidized if at all. For example, half a glass of milk contains more available phosphorus than three large doses of hypophosphites of 15 grains each, as great a dosage as is usually given.

What, then, is the therapeutic value of hypophosphites? There is no reliable evidence that they exert a physiologic effect; it has not been demonstrated that they influence any pathologic process; they are not "foods." If they are of any use, that use has never been discovered.

17. Forbes and Associates: Research Bull. 6, Ohio Agric. Expt. Sta., 1914.

ROUTINE WASSERMANN EXAMINATIONS OF FOUR THOUSAND HOSPITAL PATIENTS *

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Our object is to present the incidence of a positive Wassermann reaction among patients in a general hospital and to show the prevalence of unsuspected syphilis which can be demonstrated only by a routine test. This paper is therefore a statistical summary showing the prevalence of the various types or stages of syphilis in this class of patients, with a discussion of the frequency of a positive reaction in various diseases.

Four thousand individual cases have been tested. Of this number, 1,800 were in the medical wards and 350 in the neurologic division of the surgical service, in which, in each instance, a routine Wassermann test is done in every case. The remaining 1,850 were in the outdoor department or in the general surgical service, in which tests are made only in selected cases.

The technic used in carrying out the Wassermann reactions has been described in detail in a previous paper.[1] Suffice it to mention here that the original Wassermann technic, with the substitution of a 0.4 per cent. cholesterinized alcoholic human heart extract for antigen, was used.

Among the 4,000 cases there were 600 giving complete fixation, and these were distributed as follows: Forty-eight patients were in the very early stage of the disease; of these, thirteen had a chancre and thirty-five had a generalized rash; 306 were in a later stage of syphilis and showed various manifestations such as periostitis, gumma, endarteritis, ulcers, late rashes, etc.; thirteen cases were congenital; 120 cases had central nervous system involvement (these cases are discussed later on in this paper; they do not include those cases which, with negative findings in the spinal fluid, were diagnosed as cerebral syphilis; the latter are included in the 306 classified above as cases in a later stage). There were fifty-four positive cases with aortic disease, ten with epilepsy, ten with disease of the

* From the medical clinic of the Peter Bent Brigham Hospital.

1. Walker, I. C.: The Specificity of Cholesterin with Syphilitic Serums and of Cholesterin-Reinforced Heart Antigen in the Wassermann Reaction, Arch. Int. Med., October, 1914, p. 563.

liver, ten with disease of the kidney, nine with pneumonia, seven with diabetes, and the remaining thirteen positive cases were distributed among miscellaneous diseases.

It is of interest, first, to compare the frequency of the various stages of syphilis encountered. While 4,000 persons, of whom 600 had syphilis, were examined, only forty-eight were in the early stage, that is, thirteen had a chancre and thirty-five an early rash. Two of the chancre cases gave negative reactions on the first test, but subsequently they became positive. Although at this hospital there is no genito-urinary clinic, and consequently no special inducement is offered for such early cases to come, nevertheless thirteen chancres among so many cases examined during a period of two years seems rather small. This small percentage, however, is to a certain extent in keeping with the small percentage of cases in the late stages in which the patients deny an initial lesion but admit gonorrheal infection. This suggests the possibility of intra-urethral chancres which may be obscured by the pain and discharge of an acute urethritis, and also the possibility of the *Spirochaeta pallida* entering the tissues without producing any noticeable lesion and discomfort. Again the lack of a special clinic for this type of infection may explain the small number of early rashes. Still, among our patients with syphilis of the central nervous system, 75 per cent. deny any secondary manifestations at all, and 42 per cent. deny even an initial lesion. These are strong facts in favor of a routine Wassermann test, and against placing much reliance on a history of absence of infection as an aid in ruling out late syphilis.

There were 120 cases of syphilis of the central nervous system classified as follows: seventy-six cases of tabes dorsalis, fifteen of general paresis of the insane and twenty-nine of cerebrospinal syphilis. Of the latter, six were probably true syphilitic meningitis, in three of which there were over 500 cells per cubic centimeter in the spinal fluid. These 120 cases among 600 syphilitics, that is, 20 per cent., show the frequency of and tendency to involvement of the central nervous system, and would emphasize the importance of a Wassermann reaction in all neurologic cases. It is only fair to assume that a general hospital of this kind would share equally well with other hospitals in this type of syphilis, and the foregoing percentage would appear to be a fair estimate of the relative frequency of occurrence of syphilis of the central nervous system. Of the seventy-six cases of tabes, four gave a positive reaction only in the blood, fourteen gave a positive test in the spinal fluid alone, and forty gave positive reactions in both blood and spinal fluid. Fourteen patients seen in the outdoor department gave a positive blood test, but they did not enter the hospital for a lumbar puncture so that the spinal fluid was not examined. Since fourteen cases of tabes, or 18 per cent., gave a negative Wassermann reaction in the blood but a positive test in the spinal fluid, it seems quite necessary to have the latter tested. Four cases of typical tabes had negative reactions in the blood and in the spinal fluid in 1 c.c. amounts, although there was an increased cell count in the latter. Thus it would seem that a negative reaction in both blood and spinal fluid is uncommon though it occurs in tabes.

The diagnosis of congenital syphilis was made in only thirteen cases, in all of which there were some of its well recognized characteristics and a positive Wassermann reaction. Although the fact that very few children and no infants are seen at this hospital would go a long way toward explaining such a small number of congenital cases, still it might be conjectured either that some of the positive cases among adults without congenital stigmata are hereditary, or that such patients do not reach adult life or that syphilitic parents may beget healthy children. These possible explanations are based on some cases treated here. In two cases of epilepsy in young males whose epileptic attacks began at an early age, too early for a venereal source to be considered, and in a case of syphilitic meningitis in a child aged 3½ years, the patients were all relieved of their symptoms and signs by antisyphilitic treatment. These were probably congenital in origin. Furthermore, we have had several opportunities of testing the blood of infants and children who were born at the time their parents showed active lesions; but these offspring gave negative reactions and showed no congenital stigmata.

The susceptibility of the vascular system to syphilitic involvement was quite evident. Among the 600 positive cases there were fifty-six cases with vascular involvement, a percentage of 9.3. Aortitis, accompanied usually by an aortic insufficiency, was the most common condition; there were twenty-three of these. Aneurysm was next most frequent, with eighteen cases. Dilatation of the arch of the aorta with aortic insufficiency was next in frequency, with thirteen cases. Of uncomplicated arteriosclerosis there were only two cases with positive Wassermann reactions. The cases of nephritis with hypertension will be discussed later on; but it may be noted here that their number would raise the percentage of vascular involvement to 10 per cent.

The eighteen cases diagnosed aneurysm were verified by the Roentgen ray, and in all there were positive reactions in the blood. Two other cases with negative reactions were diagnosed clinically as aneurysm. One of these, however, was subsequently shown to be cancer of the esophagus. The other case may likewise turn out to be other than aneurysm, as the chances are 18 to 1 that it is not aneurysm. On the other hand, there were twelve cases of dilated aortic arch with a negative Wassermann reaction, against thirteen such cases with a positive reaction. From the foregoing statement one might conclude that it was unusual for nonsyphilitic dilatation of the aorta barring traumatism to progress to aneurysm formation, whereas dilatation of the aorta caused by syphilis very likely does progress to aneurysm, and antisyphilitic treatment is indicated to prevent further progress. In this series there was only one case of aneurysm of the abdominal aorta, and the blood gave a positive reaction; this aneurysm ruptured, and the diagnosis was confirmed at necropsy. One case showed an aneurysm of the popliteal artery, and the blood gave a positive reaction; there was no history of injury.

Including the cases of aortic insufficiency associated with an aortitis and with a dilated aorta, there were twice as many cases of aortic insufficiency with a positive as with a negative Wassermann reaction; but in all the other valvular lesions together, the Wassermann reaction was negative with two exceptions. The heart itself in this series of cases escaped without syphilitic involvement, with the exception of one case of paroxysmal tachycardia. This disturbance was probably due to syphilitic disease in the heart muscle,

since the attacks were inhibited by salvarsan. No cases of uncomplicated chronic myocarditis gave a positive Wassermann reaction.

Several observers have asserted that pulmonary tuberculosis often gives a positive Wassermann reaction. In this series there were ninety cases of outspoken pulmonary tuberculosis, and only three of these had positive Wassermann reactions. All the cases of tuberculous meningitis gave a negative test in both blood and spinal fluid. It would seem from this series, therefore, that there is little evidence for the conclusion that tuberculosis may cause a positive Wassermann reaction. There was one case in our series of probable lung syphilis, since the pulmonary signs and symptoms rapidly cleared up under salvarsan, mercury and potassium iodid.

In thirty-two cases of cirrhosis of the liver, there were six with a positive Wassermann reaction, and in fifteen cases of acute catarrhal jaundice there were no cases giving complete fixation, although one case gave 75 per cent. fixation at the height of the disease; but this fixation gradually diminished in strength as the jaundice diminished in intensity. A week after the first test there was 50 per cent. fixation; a week later still there was 25 per cent. fixation, and when the skin and mucous membrane had become clear, there was no fixation at all. Since bile is known to vary in its cholesterin content, it is possible in this case showing partial fixation that there was a large cholesterin content in the bile, sufficient to give this partial fixation. We do not feel, however, that bile complicates the interpretation of the Wassermann reaction to any great extent. In this series we encountered gummas of the liver in only four cases, and all yielded readily to antisyphilitic treatment.

Among the cases of syphilis showing involvement of the alimentary tract, omitting from consideration those with gumma of the tongue, of which there were four, and cases of stricture of the rectum, of which, strangely enough, only one was encountered in this series, three cases were seen which showed unusual clinical pictures. Two of these closely resembled gastric ulcer; one patient, in fact, was operated on for this condition without any definite findings at operation; the other case cleared up quickly with antisyphilitic treatment. The third patient showed definite ulcerations of the lower colon and upper rectum by proctoscope, with typical symptoms and stool findings of an extreme colitis, and was so greatly benefited by antisyphilitic treatment that he has continued practically free from symptoms for more than a year without further treatment. This case is to be reported in detail in a subsequent paper.

Several observers have asserted that syphilis plays an important part in the etiology of chronic nephritis with hypertension.[2] These adherents, however, base the greater part of their proof on the luetin reaction. It has been claimed recently that the administration of potassium iodid provokes a positive luetin[3] reaction, and probably the number of patients with hypertension not having been given potassium iodid is very small. In this series there were 120 cases of chronic nephritis with hypertension, and only seven of these gave positive Wassermann reactions. Among ninety-three cases of chronic nephritis without high blood pressure, there were three having positive Wassermann reactions. These statistics do not support to any great extent the theory that hypertensive nephritis can be attributed to syphilis. In this series there were no cases of syphilis of the kidney.

The incidence of a positive Wassermann reaction in cases of diabetes mellitus is interesting. Among eighty-nine cases of diabetes there were seven with positive Wassermann reactions. The majority of these seven cases gave a history of syphilitic infection. One case in particular is of sufficient interest to mention. Six months after a chancre and a secondary rash, this patient developed diabetes. He was treated with mercury and potassium iodid for one year, and then for six months with salvarsan and mercury without any influence on the diabetes. The blood Wassermann, however, became much weaker but never negative. The patient finally died in coma. Other parallel cases have been observed. Many observers have noted the frequency of a positive Wassermann reaction in this disease, and some have considered it due to the presence of acidosis in the serum. On repeated tests under various conditions, the Wassermann reaction was noted by us to be uninfluenced whether there was much or little sugar in the blood and urine, and whether or not the patient was in coma.

Of special interest in regard to treatment and relief of symptoms was the frequency of a positive Wassermann reaction among patients with epilepsy. In the eighty-eight cases of epilepsy there were ten cases with a positive Wassermann reaction, and of the seventy-eight with a negative reaction, seventeen had an old depressed fracture of the skull which accounted for the disease in these cases. Subtracting the seventeen fracture cases from the total of eighty-eight would leave 14 per cent. having positive Wassermann reactions and without other known etiology for the epileptic seizures. Three of the patients with positive reactions were treated with salvarsan, and have had no attacks for over a year since discontinuing the treatments. The other patients were treated with mercury intramuscularly, and the attacks were relieved while under observation. Therefore it seems that syphilis is a frequent cause of epilepsy. This statement is further substantiated by the fact that in three of the thirteen cases of congenital syphilis observed in children there were epileptiform seizures; these three cases are not included in the list of epilepsy, but are grouped under the heading of congenital syphilis. In thirty-five of the cases of epilepsy, including those with a positive Wassermann in the blood, lumbar punctures were done; the spinal fluid in every case gave a negative Wassermann reaction and a normal cell count; the colloidal gold reaction was slightly positive in Tubes 2, 3 or 4, but no tubes were more than three plus. It might be stated that although 0.1 c.c. of blood serum gave a positive fixation in these cases, less than 0.1 c.c. frequently gave no fixation, and furthermore, some of these positive reactions were changed to negative by a few mercury injections or three or four salvarsan treatments; but this negative reaction was not permanent after so little treatment. For these reasons we believe that most of these cases of syphilitic epilepsy would be entirely missed in doing reactions with any of the less sensitive antigens.

Thinking of the possibility of pneumonia at the height of the febrile period giving a false positive reac-

2. Stoll, H. F.: The Syphilis We See But Do Not Recognize, and the Importance of Familial Studies, Boston Med. and Surg. Jour., 1915, clxxiii, 608.

3. Sherrick, J. W.: The Effect of Potassium Iodid on the Luetin Reaction, The Journal A. M. A., July 31, 1915, p. 404.

tion, we judged it worth while to consider in detail this group of cases. Weekly positive reactions we considered a possible complication because of the microorganisms present not only in the lungs but also in the blood stream. In addition, it seemed that serum infected with the pneumococcus of varying type might be altered biologically even after removal from the body, if allowed to stand for a few days. Eighty cases in this series were diagnosed pneumonia; of these, nine gave positive reactions. Three patients admitted syphilitic infection; another case was one of congenital syphilis showing very definite stigmata. One gave a positive reaction on repeated examination three weeks after becoming fever free. Two cases gave ++++ reactions, only 0.003 c.c. of serum being used. One patient admitted exposure only. He was markedly alcoholic and died two days after admission, so that repetition was not possible. The only female in the series had had two premature births at seven months, with death in both instances. The last two cases are the only ones in a total of eighty in which there is the least doubt about the correctness of the reaction, and these we consider more than probably syphilitic.

In this series there were forty-five cases of typhoid fever with only one positive reaction, which was found in a child having typical hutchinsonian teeth. Sixteen cases of scarlet fever were tested while at the height of the rash and the febrile period. In none of these was the slightest fixation noted, which is strikingly at variance with a rather widespread belief that this disease often causes a positive Wassermann reaction.

Occasionally the statement is made that syphilis of the bones does not give a positive Wassermann reaction. The blood in fifty-seven cases of disease of the bones was tested; twenty-nine gave a positive reaction, and twenty-seven gave a negative reaction. Of the twenty-nine positive cases, twenty-six were diagnosed periostitis and three gumma, and all of these twenty-nine cases readily cleared up under antisyphilitic treatment. Of the twenty-seven negative cases, operation was performed in twenty, and no evidence of syphilis was found; the usual diagnosis at operation was osteomyelitis, with a few instances of tuberculosis, and two instances of neoplasm. In the remaining seven negative cases a diagnosis of traumatic periostitis was made in four and chronic osteomyelitis in three; nevertheless all of these seven patients were given antisyphilitic treatment without any benefit. Therefore it would appear that syphilis of bone is not an exception to the rule but that it, like syphilis of other tissues, gives a positive Wassermann reaction.

It seems of interest to determine the percentages of positive cases in these patients in whom syphilis was not diagnosed without the aid of the Wassermann reaction. In order to do this it was necessary to take into consideration only those patients on the medical and the neurologic services on whom routine tests were made, and to exclude all of those patients in whom a diagnosis of syphilis had been made previous to admission to the wards. Among 1,700 medical cases, there were 203, or 12 per cent., having a positive Wassermann reaction. The present illness in all of these cases was not due to syphilis. However, it is surprising how frequently the positive Wassermann reaction did clear up the diagnosis and show the way to proper therapy. On the neurologic service among 350 consecutive cases, 8 per cent. had a positive Wassermann; and in all of these twenty-seven positive cases, the lesion was due to syphilis, although none were so diagnosed before entrance to the hospital. In these positive cases the following diagnoses were made in the wards: three epilepsy, two general paresis, two periostitis of skull, seven cerebrospinal syphilis, one pituitary disease, four trigeminal neuralgia, five cerebral syphilis, two tabes dorsalis and one internal hydrocephalus.

CONCLUSIONS

1. Syphilis is even more prevalent than ordinarily supposed.
2. A routine Wassermann test is of the greatest value in a general hospital.
3. Neurologic cases should always be tested, and particularly all cases of epilepsy.
4. Cases of unsuspected syphilis greatly outnumber those frankly syphilitic among patients applying for treatment in a general hospital.
5. The common infectious diseases — typhoid fever, pneumonia, tuberculosis and scarlet fever — have no influence toward causing falsely positive reactions.
6. We find no argument in favor of a belief that chronic nephritis with or without hypertension is due to syphilis.
7. Diabetics in our series showed a fairly high percentage of positive reactions, and in one or two cases the coincidence of this disease and the onset of diabetic symptoms was suggestive but in no way conclusive.
8. The well-known affinity of the *Spirochaeta pallida* for vascular and nervous tissues is most marked, and it is unfortunate that the early lesions in the disease are so slight as to be so often unnoticed and consequently untreated at this time, when later and more serious lesions could be prevented.
9. Syphilis of the liver presents a most difficult problem in differential diagnosis. The presence of icterus should make one wary of the interpretation of any but strongly positive tests.

ALLIACEOUS ODOR PRODUCED BY IRON CACODYLATE

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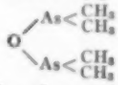
When given by the mouth, the cacodylates may taint the breath, skin and urine with a strong garlicky odor. To avoid this disagreeable contingency, it is advised to administer them hypodermically. Nevertheless, even when given in this manner, they may, although infrequently, occasion the same disagreeable smell. A girl, aged 20, under treatment for an eczema on an ichthyotic base for a marked anemia, was given in all five doses of 1 grain each of iron cacodylate. A few minutes after each dose the taint was noticeable to such an extent as to interfere with her work as assistant to a dentist. The administration of the drug had to be deferred till the late afternoon, so that the effect might wear off by morning.

The strong, disagreeable odor is due to the formation of cacodyl oxid, a substance composed of two cacodyl groups bound by one oxygen atom:



This substance is also formed with the emission of nauseating fumes, when cacodyl is exposed to the air.

CACODYL

Cadet de Gassicourt (1731-1799) was the first, in 1760, to make what is now known as cacodyl, and which for long was called the fuming liquid of Cadet (liqueur fumante de Cadet), a colorless liquid, of most disgusting odor, which gives off a highly poisonous vapor which readily catches fire in the air at ordinary temperature, and forms the above-mentioned oxid. Cadet was the contemporary and friend of Lavoisier (1743-1794), the genius who, with Priestly (1733-1804), shares the glory of founding modern physiology. Bunsen (1811-1899) originated the present name, cacodyl, and by it one may get some inkling of the odor of this substance. The word has three roots: cac-od-yl. Cac- signifies vile, -od, emitting odor, and -yl, substance; the substance emitting a vile odor.

Our forefathers imagined sulphur compounds to be the worst smelling things, and so, in creating a hell, plentifully supplied it with them. In comparison, however, with the productions of the modern chemists, the sulphur compounds of our forefathers are as attar of roses, and from this one may imagine what a substance must smell like, when a chemist such as Bunsen would feel impelled to baptize it with the name cacodyl.

Each arsenic atom in cacodyl is in very firm combination with two methyls, $-As<\frac{CH_3}{CH_3}$, so that they act in chemical reactions like a single element, stepping in and out of combinations as an independent group, so that chemists formerly gave to this group a symbol, Kd. It is this firm binding of the arsenic that makes the cacodylates so much less poisonous than arsenous acid, As_2O_3, and potassium arsenite, K_3AsO_3. In cacodyl the arsenic is trivalent, and it is the free valency shown in the formula given above that reaches out so avariciously for oxygen as to cause it to spring into flame when exposed in the open air.

Just what happens when sodium cacodylate is taken by the mouth or what happened in the instance referred to above when iron cacodylate was administered hypodermically is not known, but it may be surmised that by the chemistry of the body the sodium in the one case and the iron in the other is split off, and that by further action the two oxygens are also separated from the tightly joined cacodyl group, $-As<\frac{CH_3}{CH_3}$. This cacodyl, on coming in contact with the oxygen of the inspired air, or that on the skin, or that in the urine, in voidance, gives rise to the malodorous fumes that suggested its first name, the fuming liquor of Cadet. As these fumes are very poisonous, the quantity is very small, although its presence is very obtrusive. Why this should occur only occasionally, and why it is more frequent, as Martinet says, when given by the digestive tract and in children rather than in those who are older, is not known.[1] It may be reasonably surmised that the opportunities for oxidation are increased in the slower absorption and intricate chemistry of the alimentary tube, and it may further be conjectured that in youth the opportunities for swift oxidation in the body itself are greater than in mature years. It may, however, also occur in elderly persons, as shown in the case of a man, aged over 70, whom I once treated with salvarsan and mercury for an old syphilis. For a profound anemia he was given iron cacodylate, which caused an arsenical cutaneous pigmentation. Later he was given a still more vigorous course, which occasioned a reappearance of the pigmentation and the occurrence of an alliaceous odor of the breath.

In both these instances and in another occurring in the practice of a friend, iron cacodylate, not sodium cacodylate, was employed. Theoretically there is more cacodyl in iron cacodylate than in sodium cacodylate. Cacodylic acid radical is univalent and so is sodium, and the formula would run: $(CH_3)_2AsO_2Na$. In iron cacodylate, however, the iron is trivalent, so that three of the cacodylate group are contained in one molecule of iron cacodylate as against one of the cacodylate group in sodium cacodylate $[(CH_3)_2AsO_2]_3Fe$. Probably, however, the determining factor in the foregoing reaction is the great friendliness or affinity between iron and oxygen, enabling the oxygen of the body readily to split off the iron, and so initiate the breakdown in the molecule that eventuates in the formation of enough cacodyl to be appreciated on the breath.

323 Geary Street.

1. Martinet, Alfred: Les medicaments usuels, Paris, 1909, p. 61.

DERMATITIS HERPETIFORMIS

REPORT OF SOME CASES TREATED WITH EMETIN *

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That dermatitis herpetiformis is the indication in certain skins of a general toxemia is generally conceded. Some years ago, one of us (Engman) reported a series of cases in relation to indicanuria, and stated that in certain instances intestinal putrefaction undoubtedly was an etiologic factor. This has been demonstrated to our satisfaction therapeutically by the control of certain cases of the disease under a careful nonprotein diet. Tobacco and its excessive use have proved to be the source of toxemia in other cases, either through the direct effect of nicotin or through its influence on metabolism.

Each case of dermatitis herpetiformis is, therefore, a study in itself in the search for the source of the toxemia. Realizing this fact, we have been paying special attention to the mouth in this disease. Since the etiologic importance of infections emanating from this source has been so prominently brought before the profession by various writers, we have tried to exclude mouth conditions in the study of the disease. In cases in which pyorrhea alveolaris, ulcerated gums or pus cavities about the gums were present, they were treated by dental surgery. Where the endameba was found, emetin (alkaloid) was used hypodermically, according to the usual procedure. We believe, therefore, that the study of the following cases is interesting and important in that they undoubtedly show that suppurative conditions about the teeth and gums may be of marked etiologic importance in dermatitis herpetiformis.

We do not wish to convey the impression that emetin is a specific for dermatitis herpetiformis. It will probably improve only those cases in which it is indicated, namely, in the specific inflammation about the gums and teeth, due to the endameba, which is probably an etiologic factor in a certain percentage of cases of dermatitis herpetiformis. Besides the injec-

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tion of emetin, the condition of the mouth should be locally treated by an accomplished dentist.

CASE REPORTS

CASE 1.—A farmer, aged 50, admitted Jan. 4, 1915, had had chill and nausea, five weeks before, but no fever. Then a papulovesicular eruption developed on the arms, legs, body and nape. Later the eruption became papulopustular and very itchy. It showed a grouping tendency. Dermatitis herpetiformis was diagnosed. The patient was constipated, nervous, and there was nocturnal urination. There was pyorrhea of both upper and lower teeth. The gums were soft and swollen, and bled easily. The endameba was found. There was slight emphysema of the lungs. The heart was negative. The spleen and kidneys were not palpable; a mass was felt in the region of the gallbladder. The stomach was not dilated. Large varicosities extended upward from the external saphenous of both sides over and above the symphisis to meet in the midline. There were numerous telangiectases over the lower abdomen. The stool was negative as to parasites. The blood and urine were normal, the indican not increased.

The patient was put on a vegetable diet and laxatives. A local antipruritic lotion was employed. Veronal, 5 grains, was given at bedtime. No relief was obtained in one week. Antipruritic salve was used, and desiccated thyroid gland, 1½ grains, three times a day. There was slightly less itching, and there were no new lesions, after the second week. The itching was as severe as ever after the third week. The lotion and the salve were stopped, and cornstarch used. A colloid bath was given every second day. There was no improvement after five days.

A preparation of the thyroid gland was given for three weeks. There was no cutaneous improvement, except less itching at night, and the patient slept better. An intercurrent attack of boils was cured by staphylococcus vaccine, which had no effect, however, on the dermatitis herpetiformis. Emetin hydrochlorid, one-half grain, was begun on the patient's forty-ninth day in the hospital. Immediate and rapid improvement of the skin and the pyorrhea followed. The itching ceased after the first dose. The skin was clear. There was no itching. The patient was discharged cured after one week.

CASE 2.—A shoe worker, aged 34, has had slight pyorrhea five years, and dermatitis herpetiformis two years. There was a fine papular eruption on the body, arms and legs, very itchy. Physical examination was negative. One year previously the patient had been given treatment by vegetable diet and arsenic internally; no improvement.

Emetin hydrochlorid, one-half grain daily for six doses, was given. The skin and teeth were practically well after six injections. The patient was discharged cured after twelve days. There was slight recurrence after three weeks. The patient disappeared.

CASE 3.—The patient, aged 60, with no occupation, had had dermatitis herpetiformis and pyorrhea alveolaris for ten years. The eruption was generalized, grouped, itchy and intermittent, and papular vesicles were always present somewhere. Physical examination revealed the patient as normal except that the liver was slightly enlarged. The urine showed a trace of albumin, and also pus. The blood was normal. Emetin hydrochlorid, one-half grain, was given for six doses. The itching was much improved and all lesions involuted after four doses. All lesions were gone after six doses. The patient was discharged after three weeks, cured. There was no pyorrhea.

CASE 4.—Man, aged 52, with no occupation, entered the hospital July 1, 1913. Dermatitis herpetiformis was diagnosed. There was a general vesicopustular, very itchy, grouped eruption. The patient had had it for two years. He was put on a vegetable diet and given hypodermic injections of sodium cacodylate, three-fourths grain, daily. The patient was discharged cured in two weeks.

He entered the hospital a second time, Oct. 10, 1914. There had been a severe recurrence for eight or nine months, and he had been treated with staphylococcic vaccines during part of this time at another hospital with no results. He showed on entrance the same eruption as in July, 1913. It was very extensive and itchy, and the pustular aspect was especially marked. The patient was also suffering from pyorrhea alveolaris. The endameba was found. He was put immediately on sodium cacodylate injections, with little or no result. He developed acute nephritis with severe albuminuria and plentiful granular casts; sodium cacodylate, therefore, had to be given cautiously, but on milk diet, a tolerance to the drug in three-fourths grain doses was established. No effect, however, on the dermatitis herpetiformis was noted. Vegetable diet, a preparation of the thyroid gland and various local applications were used over long periods without avail. The albumin after three months was reduced to a trace, and casts disappeared from the urine. Emetin hydrochlorid, one-half grain, was given daily from March 5 to March 10, 1915. Marked improvement in the pyorrhea and the eruption began at once. After two weeks only a few lesions were left on the body, but quite a number persisted in the beard, where the eruption was wholly pustular. April 3, there was a general recurrence over the body and legs, and a second course of emetin injections was given. Steady but slower improvement resulted, the lesions on body and limbs disappearing in six weeks, leaving only the eruption in the beard, which gradually grew less, but there were still a few lesions there when the patient left the hospital three months after the last course of emetin. There were no casts and only a trace of albumin in the urine when the patient was discharged. No amebas were present. He was practically well.

THE SIGNIFICANCE OF CERTAIN ROENTGENOGRAPHIC FINDINGS IN THE GASTRO-INTESTINAL TRACT *

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The observations recorded in this paper were made on a series of fifty gastro-intestinal cases studied by all the usual clinical methods, including roentgenograms following a bismuth meal. The results throw some new light on the significance of certain roentgenographic findings.

The clinical examination and the roentgenographic plates were made; notes were recorded both on these findings and the operative or necropsy reports at separate times. Diagnoses as complete as possible were made previous to operation or necropsy. Afterward twenty-four of the patients were operated on, thus providing a certain check on the accuracy of the ray diagnosis. Although the other twenty-six patients were not operated on, their subsequent histories, response to treatment or necropsy reports give a partial check on the accuracy of the diagnosis. The study of the plates was completed and the diagnosis made before operation, treatment, subsequent history, or necropsy reports had been made. So these had no influence on the diagnosis.

The results are especially instructive when arranged according to certain findings, instead of according to cases. That is, for example, when all cases showing what might well be called persistently infraposed stomach are arranged together, it indicates the significance of that finding; or when all cases showing supraposed stomach are studied together, it reveals the significance of that finding. The main results of such a study are presented below.

* Read before the Allegheny County Medical Society, October, 1915, Meeting.

* From the Department of Internal Medicine, Laboratory of Roentgenology of the South Side Hospital.

The roentgenograms were taken with the patient in the standing position. Normally the position of the stomach seems to vary a good deal. Fluoroscopic examination of the stomach has confirmed this view. The stomach has been directly observed to move up and down. It also is seen to move synchronously with the movements of the diaphragm in respiration, especially in children.

In thirty-six of the cases in this series the stomach had the ability to change its position without the aid of a change of posture of the patient. The first plate was taken immediately after the bismuth meal, and it normally showed the lesser curvature at or slightly below the umbilicus. The second plate was taken thirty minutes after the taking of the bismuth meal. The plate normally shows the entire stomach above the umbilicus.

Nine of the remaining fourteen cases showed the entire stomach to be persistently above the umbilicus. Of these nine cases three patients were operated on, one showing cholecystitis with adhesions and chronic appendicitis; another showed carcinoma of the lesser curvature; the third showed a vicious circle following a previous gastro-enterostomy. The remaining six cases were diagnosed with probable accuracy by clinical and laboratory reports, subsequent history, and results of treatment as follows: three cases, syphilis of the stomach; one, chronic appendicitis; one, chronic cholecystitis; and one showed a well-marked loop in the descending colon.

The other five remaining of the fourteen cases showed the stomach persistently below the umbilicus. Four of these cases at operation showed as follows: one case of carcinoma; three cases of simple ptosis. The other remaining patient was not operated on, but the condition was diagnosed with probable accuracy as vertical stomach with chronic appendicitis. In this case the pylorus was persistently below the umbilicus, while the fundus was high in the epigastric region.

Normally the stomach varies in size and form even more than it does in position. In this short note no attempt will be made to discuss these normal variations extensively, except to point out that there are great alterations according to the length of the mesentery of the stomach and intestines, which depends on the extent of extragastric adhesions, the muscular tonus of the stomach and esophagus, the character of the nerve supply to these structures, which depends largely on the mental state of the individual, and finally, intra-abdominal pressure changes due to muscular contraction of the diaphragm and abdominal muscles. Any disease such as syphilitic or gummatous myositis of the muscular coat of the stomach, syphilitic alterations of the nervous system, various infections of extragastric organs, and secondary changes in the general constitution of the individual such as anemia, inanition, etc., due to any chronic infection or toxemia, can interfere with this normal variation in size, shape, and position of the stomach by their effect on one or all of the factors concerned. Numerous abnormal forms have been described such as fish-hook, water-trap, hourglass, etc. These various forms are thought to be significant. For example, spasmodic hourglass stomach indicates slight or acute ulcer, or else it means abnormally marked peristaltic action, while persistent hourglass stomach indicates chronic ulcer with cicatricial contraction.

As mentioned above, normally the stomach varies greatly in size. When empty it has been seen by direct inspection to contract down to the size of a rope. The antrum is especially liable to contract in this way during operation. Therefore, unless the stomach is persistently enlarged one is not justified in making a diagnosis of chronic dilatation. Likewise, one is not justified in making a diagnosis of infraposed or supraposed stomach unless the entire stomach is persistently below or above the umbilicus.

Persistent incisures are most frequently due to local cicatricial contraction following chronic ulcers. Continued spasmodic contractions are most frequently due to acute ulcers or gastric adhesions.

Temporary incisures or diverticuli are most frequently due to normal peristaltic waves. They are best seen by fluoroscopic examinations or by rapidly succeeding plates, by means of which their significance as regards duodenal or gastric ulcer can be determined. Persistent diverticuli are most frequently due to deep ulcers.

Normally the stomach should be empty in less than six hours. The cecum should be filled by eight or ten hours, and empty by twelve. The whole bismuth meal should be passed in thirty-six or forty-eight hours.

In this series of fifty cases twenty-eight showed six hour retention, which varied from a small amount to nearly the whole bismuth meal. The retention persisted in two cases till seventy-two hours.

Of these twenty-eight cases showing gastric retention, twenty presented a slight retention after six hours, one showed eight-hour retention; two cases had forty-eight-hour retention; two showed seventy-two-hour retention, and three cases twenty-four-hour retention.

Of the twenty cases showing slight retention, ten patients were operated on. All of these save three showed chronic appendicitis. These three showed as follows: two cases of pyloric stenosis due to intragastric cicatricial contraction; one case presented ptosis of the colon and gallstones. The remaining seven cases presented, together with chronic appendicitis, the following: three cases, unmixed chronic appendicitis; one case, chronic appendicitis, pyloric stenosis, movable kidney, and rectocystocele; one patient had chronic appendicitis and adhesion of the omentum to the cecum and the ascending colon; one presented chronic appendicitis and pyloric stenosis, and one had persistent hourglass stomach and chronic appendicitis.

The remaining ten cases which showed slight retention but in which there was no operation were diagnosed by clinical examination, subsequent history and results of treatment as follows: syphilis, thyroidism, rheumatism with focal infection in the appendix; two cases of chronic appendicitis with ptosis of the stomach and intestines; one case of chronic appendicitis; and one case of typhlitis and megacecum. One case each of syphilis, thyroidism, rheumatism, typhlitis and megacecum, and chronic cholecystitis, five cases of chronic appendicitis of which two showed also ptosis of the stomach and intestines, two others of which showed also chronic constipation.

The single case which showed eight-hour retention at operation presented results of a previous gastro-enterostomy and appendectomy. Of the three cases showing twenty-four-hour retention; one patient showed at operation a carcinoma of the lesser curvature of the stomach and esophagus. The other two patients were not operated on but the cases were diagnosed as carcinoma of the stomach. Of the two cases showing forty-eight-hour retention, both patients were operated on, one showing chronic appendicitis, chronic

cholecystitis with gallstones; the other carcinoma of the stomach.

In the two cases showing seventy-two-hour retention, one patient when operated on presented carcinoma of the stomach, and the other was diagnosed clinically and confirmed at necropsy as carcinoma of the stomach.

In the remaining twenty-two cases in which the stomach was empty in less than six hours, nine patients were operated on and diagnosed as follows: one case, duodenal ulcer and chronic appendicitis; one case, salpingitis; two cases, chronic cholecystitis with chronic appendicitis; one presented an adhesion between the stomach and an old abdominal scar; one, Lane kink of the ileum; one, simple acute duodenal ulcer in which the stomach was empty in two hours; one, enteroptosis and perineal tear; one, cancer of the liver.

The remaining thirteen patients in whom the stomach emptied in less than six hours were not operated on, but their cases were diagnosed clinically as follows: two cases, syphilis; one case, slight chronic appendicitis; one case, secondary anemia with red blood cell count of 1,000,000; three cases, slight chronic appendicitis; the remaining six presented practically normal roentgenograms.

The duodenum has become a very interesting part of the gastro-intestinal tract, because of the frequency of ulcer in various stages beyond the pyloric sphincter. Recently, the duodenal cap or bulb has received much attention because of the characteristic outline it shows in roentgenograms. Any distortion of this outline is considered significant of a lesion in the walls of the duodenum, even within the duodenum, such as ulcer, or without the duodenum, such as adhesions.

It is possible that in this portion of the duodenum ulcers may exist which are of such a slight extent that they cannot influence the outline of the duodenal cap. For this reason one negative roentgenogram is not sufficient to prove the absence of a lesion in the duodenum. If a deformity of this cap does not appear, it is not conclusive evidence that a very slight ulcer, or multiple slight ulcers, may not exist. Other clinical signs have to be taken into consideration in making a diagnosis.

The remainder of the duodenum is not very satisfactorily shown in roentgenograms. So it is hard to arrive at a conclusion in roentgenologic study of this part of the duodenum. Therefore, it is possible to have ulcers existing in the duodenum which cannot be demonstrated by the ray.

Hyperperistalsis is also considered evidence of an irritating lesion in the duodenum.

The position of the jejunum, ileum and large intestine varies much the same as does the stomach, and depends on the factors mentioned before, which govern the position of the stomach.

Lesions of the jejunum must be rare, inasmuch as very few cases have been observed in which chronic local pathology existed in the jejunum, and roentgenologic study of this portion of the intestinal tract has not thrown any more light on it up to the present.

Lane's kink of the ileum has recently received much attention. In two cases in this series it was demonstrated by ray. One of these patients was operated on, and operation confirmed the roentgenologic diagnosis.

Incompetency of the ileocecal valve, which has been noticed by a number of observers, can be demonstrated by ray; but its clinical importance has not as yet been ascertained.

The cecum has been observed in various positions, depending on the same influences which alter the position of other abdominal structures.

Normally it lies in the right iliac fossa, but has been observed as low down as in the pelvis or as high as the umbilicus. Its altered position has various diagnostic possibilities, but as a rule it indicates adhesions to pelvic organs or other abdominal structures.

Bismuth retention in the cecum for more than eighteen hours is evidence of atony of the muscular walls, chronic inflammatory conditions of the peritoneal covering, chronic appendicitis, or extracecal adhesions. Atony can be determined by general observation of the rate of movement of the bismuth throughout the gastro-intestinal tract.

Nine patients in this series operated on proved to have chronic appendicitis either alone or in combination with some other lesion. All of these patients showed retention in the cecum varying from twenty-four to seventy-two hours.

The position of the colon also varied, depending on the factors mentioned before. This has various diagnostic possibilities which can be readily seen from a general study of the gastro-intestinal tract.

Alterations in the position of the hepatic and splenic flexures are usually due to peritoneal adhesions, and signify inflammatory conditions in these regions.

Angulations also occurred, and were usually due to relaxed or elongated mesentery or scar tissue within the large intestine at the point of angulation.

SUMMARY

Normally the stomach can change its position without the help of alteration in body posture. When this mobility of the stomach is lacking it is either due to restraining forces which prevent the movement, or else to lack of power to move. The former is the most frequent cause for lack of change of position of the stomach.

Persistent supraposed stomach is due to a restraint and not to lack of power. This restraint is most frequently exercised by adhesions due chiefly to cholecystitis, chronic appendicitis, traumatism (previous operation), or gastritis due to syphilis, cancer or ulcer.

Persistent infraposed stomach is not as frequent as supraposed stomach. It is caused by restraint or lack of power to move, most frequently lack of power, which is the case in chronic gastro-enteroptosis with relaxation of the abdominal walls.

Long retention of the gastric contents (twenty-four hours or longer) is chiefly due to one cause, namely, cancer of the stomach. The other chief cause is long standing chronic cholecystitis. Retention for shorter time (six to twenty-four hours) has for its most frequent causes cicatricial contraction of pylorus due to healed ulcers, chronic appendicitis, chronic cholecystitis, typhlitis and syphilis.

Pylorospasm does exist, but it is not always present when extragastric lesions are prevalent. It probably depends on the reflex excitability of the individual's nervous system.

Diagnosis made by judging from the roentgenograms, together with the history of the case and other clinical evidence obtainable, were correct in nearly every case. This was demonstrated in the majority of the cases by subsequent operation or necropsy. In most of the others it was shown with a satisfying

degree of probability by the subsequent course of the case.

Roentgenograms have revealed certain facts which can be demonstrated by other means. The most prominent of these are the obstructive lesions which are as a rule located either in the pylorus of the stomach or in the region of the cecum and are usually due to definite conditions.

By the use of the stomach tube in gastric analysis, fecal examinations, the charcoal test, Bastedo's test and careful analysis of clinical symptoms and physical signs, it is possible in a certain number of cases to make a very accurate diagnosis without the use of the ray. In all cases which are readily diagnosed without the ray, however, roentgenograms should be taken and carefully interpreted along with laboratory tests, clinical history and physical findings, in order to obtain a clear diagnosis.

GENITO-URINARY SYMPTOMS ARISING FROM ANAL, RECTAL AND COLONIC DISEASES, AND VICE VERSA

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It is just ten years ago since a separate department devoted exclusively to the treatment of anal, rectal and colonic diseases was instituted in the San Francisco Polyclinic. As this was the first clinic of its kind established west of the Mississippi River, its growth was at the beginning quite slow, since it took some time before the internists, surgeons and allied specialists recognized its value as an aid in diagnosis and treatment. In recent years, however, through the cooperation of my colleagues in the different clinics, the rectal department has gradually grown until now, in point of attendance, at least, it compares most favorably with like clinics in older established institutions in Eastern cities.

To the genito-urinary surgeons in particular does it seem to have been satisfactorily demonstrated that the proctoscope may be at times of valuable assistance in diagnosing some of their more puzzling cases. Through their courtesy I have been enabled to observe many interesting cases in which anal, rectal and colonic symptoms have arisen from lesions in the genito-urinary tract, and, vice versa, in which symptoms apparently due to genito-urinary disease in reality were caused, either reflexly or mechanically, by pathologic conditions in the lower end of the alimentary canal.

This can be readily accounted for by remembering that the origin in the spinal cord of the nerve supply to the anorectal region and to the genito-urinary tract is practically the same, and therefore any irritation of the nerve endings in the one is very likely to be reflected in the other; secondly, there is a close anatomic relationship between the two which not only makes easy any extension of inflammation or of neoplastic growth, but also allows of mechanical pressure and its consequences; and third, the venous circulation of the bladder, prostate and urethra is in very close association with the rectal plexus of veins, so that passive congestion in either set of organs may be communicated to the other.

Disturbances in the act of micturition are symptoms most commonly met with by the urologist. As lesions in the urinary tract which give rise to frequent, painful or difficult urination lie strictly within his domain, they will not be touched on in this paper. Only those conditions in the colon, rectum or anus which, reflexly, or by direct pressure, cause these annoying symptoms will be mentioned, as they are not often considered by the general practitioner, and are not infrequently overlooked by the specialist.

A quite common cause of frequent and painful urination in male adults is the pressure on the bladder and prostatic urethra by a mass of feces in a distended rectum. This occurs especially when there happens to be added a severe proctitis due to the dyschesia. Like symptoms are caused by pressure on the bladder by the sigmoid when it is atonic, dilated and loaded, or when it is displaced, inflamed and filled with stagnating feces. This condition occurs much more frequently than is generally recognized, more especially so in women in whom a loop of the sigmoid may be held down by adhesions from a former pelvic inflammation. Quite a number of these cases have come under our observation. Thoroughly evacuating the colon by irrigation as a general rule brings about rapid amelioration of the vesical symptoms.

Vesical irritability not uncommonly accompanies neoplasms of the rectum and sigmoid, hemorrhoids and chronic mucous colitis. In the latter it may so predominate over all the other symptoms, even that of the periodic attacks of diarrhea, and there may be also such severe tenesmus, pain in the posterior urethra, and tenderness over the bladder that patients not infrequently seek the advice of the urologist under the impression that their trouble is caused by disease of the prostate or bladder. Treatment of the genito-urinary symptoms of course will be of no avail. All therapy must be directed towards the colon before the urinary symptoms will be relieved.

Ulcerative conditions in and about the anal region, such as fissures, chancres, chancroids and perianal eczemas are reflexly the cause of frequent and painful urination. With fissure, in particular, the symptoms may so closely simulate those of urethral stricture that treatment has already been instituted for the latter condition before the real cause was recognized.

Inability to pass urine, accompanied by frequent desire to do so, is a not infrequent complication of the presence of a hard foreign body in the anal canal. Attempts to urinate are accompanied by sharp pain in the anus, but the predominating symptoms are genito-urinary; and when these organs are searched in vain for what might account for the suffering, the case becomes a puzzling one if a rectal examination be omitted.

In acute proctitis, in acute dysentery and in the presence of inflamed and ulcerated hemorrhoids, there is sometimes reflex dysuria and vesical tenesmus due solely to the irritable rectal condition. After operations on the rectum, and especially after a hemorrhoidectomy, inability voluntarily to void urine, and even strangury, are quite commonly met with.

When there is an abscess formation about the anorectal region, the patient may have difficulty in urinating, and sometimes cannot void at all. This is particularly so when the abscess is of the intermural type in which the accompanying edema probably presses on the urethra. As no swelling is usually to be

detected on the outside, and as there may be hardly any pain whatever in the rectal region, inability to pass urine is the main cause of complaint on the part of the sufferer.

Long retention of feces in atonic rectums of old men who also have enlarged prostates sometimes causes difficulty in micturition by adding more congestion to the already swollen gland. It is just this little added enlargement from the irritation which is caused by the fecal stasis that suffices to let the already greatly overstrained expulsive powers of the bladder fail to overcome the obstruction to the passage of the urine.

Pinworms in the rectums of children often give rise to irritability of the bladder. Nocturnal urinary incontinence frequently results from large fecal accumulations in the rectum mechanically irritating the neck of the bladder, and, in some instances perhaps, pressing on the fourth sacral nerve. Prof. Freiderich Muller of Munich has shown that, not so rarely as has been thought, a pyelitis has resulted from chronic fecal stasis and that this was in some children the cause of the nocturnal enuresis.

Cancer of the rectum is usually so insidious in its growth that an anuria may be one of the first symptoms of the disease. The anuria is caused either by mechanical pressure on the ureters or by their involvement in the cancerous growth. Constant or periodical anuria frequently complicates rectal cancer in its degenerative stage.

A syphilitic stricture of the rectum is also apt to be quite insidious in its formation, and may give rise to hardly any rectal symptoms, even though it has developed a considerable degree of constriction of the bowel. Individuals so afflicted often complain only of a slight dysuria, or of frequent urination, and on this account have been treated for a cystitis, urethritis, or urethral stricture before a rectal examination disclosed the real trouble.

Abnormalities in the urine, resulting from colonic conditions solely, are occasionally met with. That hematuria may be due to an intestinal toxemia accompanying a torpid condition of the large bowel is perhaps rarely thought of by the urologist. The renal hemorrhage may follow a hematogenous bacterial infection in the kidney, generally from a bacillus coli activity. A mercurial laxative, together with thorough colonic irrigations and a nonprotein diet, usually controls the symptoms by lessening the toxemia.

Albumin and even casts have been occasionally seen in the urine of persons with acute and chronic intestinal stasis or enteritis. These abnormalities in the urine may be evidence of simple renal irritation due to the excessive elimination of indican. These cases so resemble nephritis that they have been so diagnosed in some instances. Individuals having this condition usually claim they are not constipated and say that they have a daily bowel movement, yet a proctoscopic examination often shows the upper rectum and sigmoid filled with balls of feces. By a routine examination for indican it will be found many times when not expected.

Transparietal infection through the lymphatics from the intestine may be the cause of a cystitis. This has been observed to follow appendicitis, dysentery and internal hemorrhoids. The bladder may also be infected by the colon bacillus from a rectum or sigmoid chronically distended by feces.

Pyelitis is not at all a rare complication of fecal stasis, in elderly women and in children especially, as the kidneys, particularly the right, which is most often affected, are in intimate contact with the flexures of the colon. The renal pelves become infected by the *Bacillus coli communis* which passes from the intestines at those points where there is a coprostasis. All the symptoms from the pyelitis are greatly relieved when the source of infection in the bowel is removed by high colonic irrigations. Granville MacGowan has reported cases in which he observed "the tide of colon bacilli rise and fall in the urine according to the neglect or care that was bestowed on the bowels."

At this point I would digress for a moment to say that I think the so-called high colonic irrigation, as given in our hospitals, is of very little value. It is usually administered by the nurse through a soft colonic tube which, no matter how far it appears to be introduced up the bowel, simply coils on itself and very rarely passes by the rectosigmoidal valve. As a consequence the irrigating fluid rapidly dilates the rectum, and while a part flows onward into the upper colon the remainder causes such a painful and urgent desire immediately to evacuate the rectum that the purpose of the irrigation is defeated. The proper way is to put the fluid directly into the sigmoid. This can be done by introducing a Wales bougie through a proctoscope which has been passed by sight over the valve of O'Bierne into the pelvic colon. It is then remarkable how much fluid can be retained by the patient without experiencing any discomfort whatever.

Spermatorrhea, with prolonged and annoying erections, and accompanied by frequency of urination, coming on especially after the sufferer is warm in bed, may be the result of the presence of a large fecal accumulation in the rectum and sigmoid. These symptoms occur usually in individuals of a highly nervous temperament, and are partly reflex in nature and partly due to direct pressure of the fecal mass on the third and fourth sacral nerves. A young man suffering from these symptoms in a most aggravated form was referred to me recently by a genito-urinary surgeon who had made a thorough examination of the genito-urinary organs without being able to find anything to account for the condition. As the patient gave a history of some rectal trouble a few years previously, an examination of the anorectal region was requested. There was found a pronounced spasmodic condition of the sphincters ani, a well-marked intestinal stasis, and the presence of scar tissue from a former operation in the anal canal. Gradual and regular dilatation of the sphincters, together with high colonic irrigation, restored the patient to good health.

In the female, masturbation is often caused by a pruritus or other abnormal sensitiveness arising from prolonged retention of a fecal mass in the rectum and sigmoid, which presses on the nerves and veins, and so produces congestion in the genital parts. Pain after coitus may be due to the presence of hemorrhoids, especially when they are inflamed and ulcerated. Impotence following on their removal has been observed by me in a man in whom it was probably brought about by the pain in the anus, from sphincteric contraction on the scars, which he felt at the time of intercourse. The fear of pain brought on a psychic impotence.

Varicocele may be caused sometimes by large fecal accumulations in the rectum obstructing the venous circulation.

An enlargement of the inguinal glands occurs with chancre of the anus. When these glands are infiltrated without apparent cause the anal region should always be examined. Chancre of the anus occurs more frequently than is generally supposed, and individuals so afflicted go to make up a large part of those patients who, having secondary or tertiary syphilis, strenuously, yet honestly, deny any knowledge of ever having contracted the disease.

The inguinal glands also become infiltrated during the progress of cancer of the rectum which is encroaching on the anus.

Those anal, rectal and colonic symptoms and conditions which arise from affections of the genito-urinary tract will now be considered.

A not uncommon condition encountered is constipation in old men, resulting from an enlarged prostate which impedes the expulsion of feces from the rectum. To the mechanical obstruction there is added the inflammatory action on the rectal mucosa from the irritating presence of the enlarged gland, so that as a consequence the feces become dry, hard and perhaps scybalous.

Pain from disease of the bladder, prostate and seminal vesicles, from colic caused by passage of a renal calculus, or from contusion, inflammation or torsion of the testicles, may, by reflexly inhibiting peristalsis, be a cause of intestinal stasis.

Stricture and other urethral lesions, and stone in the bladder, may, by giving rise to reflex spasms of the sphincter ani muscles, cause hypertrophy of these muscles, and this results in constipation.

I have observed several cases of enlargement of the prostate, in which there was some slight incontinence of feces, particularly noticeable immediately after a digital examination. It seemed to me that when the gland enlarged it encroached on the anal canal and made it slightly patulous.

Through mechanical action an enlarged prostate may cause swelling of the hemorrhoidal veins. These varicosities in themselves have a tendency to cause constipation by obstructing the free passage of feces.

Where there is stricture of the urethra, severe urethritis, phimosis, cystitis, vesical calculus, or prostatitis, the straining necessary to perform the act of micturition may bring on hemorrhoids, or even prolapse of the rectum. The latter occurs most often in young children.

In pruritus ani it is often such a difficult problem to find the cause that every possible diagnostic means should be employed to discover the etiologic factor. That itching may come reflexly from a lesion in the genito-urinary tract is generally overlooked. Yet pruritus ani may be closely associated with urethral pruritus, and be due to the very same causes as the latter. Urethral stricture, polypi in the urethra, inflammation of the urethra, especially of the deep urethra or its adnexa, phimosis, stone in the bladder, gonorrhea in women, and enlargement of the prostate gland, are some of the more common reflex causes of anal itching. On the other hand, I have seen a very severe scrotal and perineal pruritus caused by lesions entirely within the anal canal.

A number of cases have come under my observation in which, as a result of too frequent or too energetic massage of the prostate, an anal fissure, ulceration of the rectal mucosa, or a proctitis has resulted. Prolonged irrigation with hot water in the treatment of inflammatory conditions of the prostate and seminal vesicles were also causes at times of quite a severe proctitis.

One case of colitis and proctitis was seen which I am certain was due to the prolonged ingestion of mercury given in treatment of syphilis.

These cases were referred on account of anorectal symptoms such as pain on defecation, a feeling of uneasiness or fulness in the rectum, or rectal tenesmus. Occasionally instead of a fissure, which one would expect to find from the history and symptomatology, a chancre of the anus, or chancroids, have been discovered.

Consequent on secondary inoculation from a vaginal discharge, burning and pain in the anorectal region, with difficulty in defecation, may be symptomatic of a gonorrheal proctitis in women. All the cases of gonorrhea of the rectum in the male which I have seen were generally of the primary type, due to pederastic practices.

From acute and chronic posterior urethritis, prostatitis, and vesiculitis, burning or shooting pains may be referred to the rectum and anus. Sometimes there may be only a vague sensation of fulness which comes on even though the rectum is entirely empty of feces.

Neuralgia and bearing down pains in the rectum may be the most prominent symptoms caused by a stricture in the deep urethra. These are the cases which, if attention be not paid to the urethra, give the rectal surgeon much trouble in effecting a cure.

Stone in the bladder may also be a cause of a variety of rectal symptoms when there is no lesion at all in the anus or rectum.

A feeling of considerable uneasiness about the anorectal region, together with pain at time of bowel movement, may be the only symptom caused by a urethral abscess, which, having penetrated behind the triangular ligament, instead of becoming a perineal abscess as is usual, is about to present at the anterior wall of the rectum. In such an event, especially when there is a seeming absence of urethral pathology and no urinary symptoms to amount to anything, the diagnosis is often for a time quite a riddle.

Neoplastic growths of the bladder, prostate and seminal vesicles may give rise to rectal symptoms such as are common in the early stages of rectal cancer. There may be at first no urinary symptoms whatever. The trouble is then likely to be mistaken for a rectal cancer until later on when the marked urinary symptoms point to the real cause. In cancer of the prostate there is often severe rectal tenesmus.

Untreated gummas of the rectum are quite prone to ulcerate and break down. From the surface and borders of the resulting ulcers there may spring up an exuberance of granulations which appear like the fungous masses seen in malignant neoplasms. For this reason I have always deemed it safest and wisest to have a Wassermann test made in every suspicious growth of the rectum, before arriving at a final diagnosis.

A deep-seated abscess of the prostate gland, with an immense brawny infiltration of the glandular and periglandular tissues, may so greatly resemble a malignant growth of the rectum as to be mistaken for the latter. Two cases of this kind have come under my observation. It may perhaps in passing be of interest to note that in both there was a history of a recent general furunculosis. One was seen in consultation recently at the San Francisco Hospital. A provisional

diagnosis of cancer involving the rectum and prostate had been made, and a proctoscopic examination requested. The instrument was passed up above the growth to about the rectosigmoidal junction and then gradually withdrawn. As it passed over the swelling the mucosa was noted to be granular and inflamed. When the edge of the proctoscope was pressed against this reddened area a little spurt of blood was observed, and when more pressure was made over this point quite a free flow of pus took place, establishing a diagnosis of abscess of the prostate.

In consequence of abscess formation from disease of or injury to the genito-urinary tract, a fistulous tract opening into the rectum is very liable to result. The possibility of a fistula-in-ano arising from these organs should be borne in mind.

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CARCINOMAS OF THE NASOPHARYNX *

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In 1904, Laval[1] was able to collect only twenty-seven instances of primary carcinoma of the nasopharynx. Since that time there have appeared under the title of carcinoma of the nasopharynx, or included with reports of other tumors of this region, fairly complete reports of twenty-six additional carcinomas. As Kelsey and Brown[2] have remarked, there is unusual difficulty in summarizing the literature of this subject. Tumors are not always classified alike by surgeons and pathologists, and carcinoma of this region has at times probably been confounded with sarcoma and endothelioma. Many carcinomas reported as having their origin elsewhere may have been primary in the nasopharynx. From all available reports, these authors estimate the relative frequency of tumors of the nasopharynx as: carcinoma, 30 per cent.; sarcoma, 60, and endothelioma, 10 per cent. Some are of the opinion that endotheliomas are more frequent.[3]

Most carcinomas of the nasopharynx originate in the vault or on the posterior wall, though of the five reported by Citelli,[4] all but one, he states, began on the lateral wall. He gives the most accurate and complete histologic descriptions, and states that three of the five carcinomas originated from the covering epithelium of the mucosa (one papillary and two cylindric), the other two from carcinomatous degeneration of the epithelium of the mucous glands. It is stated that carcinoma of the nasopharynx may originate, rarely, from the elements which make up the pharynx-hypophysis or from other residual epithelium in the formation of the infundibular stalk, the so-called craniopharyngeal canal. No instance is reported.

Carcinoma of the nasopharynx is characterized by a rather long latent period, and hence it is difficult to estimate the duration of any particular tumor. One patient, aged 40 years, with a carcinoma of the nasopharynx,[5] lived four years and eleven months after the tumor was recognized. The malignant tumors of this region give rise to almost identical symptoms, and have a similar course. Carcinomas are more prone to ulcerate and lead to epistaxis. For a fairly complete discussion of the course, complications and differential diagnosis, one should see the general discussion in the thesis of Laval[1] and the more recent report by Oppikofer.[6]

The tumor mass in the later stages, after the ulceration has begun, always appears irregular, fungus-like, gray, multilobulated, covered by a bloody purulent exudate, and may be very hard or soft, depending on the histologic variety. Here as elsewhere the younger the individual the more rapidly fatal is the carcinoma as a general rule.

Extension may take place in four directions:

1. The inferior or pharyngeal route. The soft palate is rapidly invaded. Difficulty in alimentation is then a chief cause of the cachexia.

2. Lateral prolongation. This route is not very frequent. The tumor may invade the eustachian tube early. When this occurs there is sooner or later a middle ear disorder on that side which in several instances has been the initial symptom.

3. The anterior or nasal route. There is readily growth forward with invasion of the sphenoidal, frontal and ethmoidal sinuses. By this route the tumor may involve the brain, penetrating into the anterior cerebral fossae with termination in an enormous intracranial tumor.[7] The maxillary sinus and orbit may be invaded. In the event of such extensive anterior growth there is intense pain referred to the terminals of the upper divisions of the trigeminal nerve, due to pressure by the tumor on these nerve trunks.

4. The posterior or cranial route. This is not common. The tumor may invade the brain secondarily. There is erosion of the bone (Lotzbeck), compression of the brain, extreme persistent headache, ocular disturbances, exophthalmos, stasis in the ophthalmic veins and other symptoms of tumor of the base of the brain.

Carcinoma of the nasopharynx very rarely produces visceral metastases. There is only one instance recorded. The statement then made was that there was a small metastatic growth in one kidney and nowhere else. At the two postmortem examinations, reports of which follow, no tumors were found anywhere in the viscera, and all organs were carefully examined both grossly and histologically. As a rule carcinomas of the nasopharynx give earlier adenopathy than other tumors of this region, and several patients consulted the physician on account of the enlarged cervical lymph glands. In other patients glandular enlargements did not appear, though this is rare. Molinie[8] wishes to impress that the cervical adenopathy is a fairly con-

* From the Pathological Laboratory of Rush Medical College.

1. Laval, Frederic: Des tumeurs malignes du naso-pharynx (étude clinique) Toulouse, 1904; Des tumeurs malignes du naso-pharynx, Arch. internat. de Laryng., 1905. Two of these tumors referred to by Laval, "Observationes VII and XIX," are not certainly carcinomas because of lack of proper histologic and postmortem evidence. Some of the early tumors tabulated by this author were not definitely either carcinoma or sarcoma, but were merely malignant tumors, and may have been primary elsewhere, as "Observatio III" of Verneuil and Flour, in which the tumor may have been primary in the thyroid gland. For further details, see the thesis of Laval.

2. Kelsey, A. L., and Brown, J. M.: Malignant Tumors of the Nasopharynx, Ann. Otol., Rhinol. and Laryngol., 1913, xxii, 1147.

3. Trotter, W.: Brit. Med. Jour., 1911, ii, 1057.

4. Citelli: Ten Cases of Primary Tumor of the Nasopharynx, Ztschr. f. Laryngol., 1911, vi, 331.

5. Brown, E. J.: Epithelioma of the Nasopharynx, Laryngoscope, 1898, v, 219.

6. Oppikofer, E.: Ueber die primäre maligne Geschwülste des Nasenrachenraumes, Arch. f. Laryngol. u. Rhinol., 1913. The list of the references cited at the end of this report is very extensive and concerns all of the tumors of the nasopharynx.

7. See the descriptions of the tumors reported by H. Schmidt and Lotzbeck in the treatise by Martin Mulfarth: Ueber maligne Geschwülste des Nasenrachenraumes, Aus der Chirurgie Klinik zum Bomm, January, 1893.

8. Molinie: Cancer du Naso-pharynx, Larynx, Marseilles and Paris, 1913, vi, 75. The tumor reported by Molinie, though probably a carcinoma, is not included with the twenty-six instances collected since the Laval summary because of insufficient histologic proof.

stant early sign of malignant tumor of the nasopharynx, and urges a very careful examination of the nose, pharynx and nasopharynx whenever a cause for cervical adenopathy is not found elsewhere. Carcinoma of the nasopharynx is particularly characterized by infiltration, disintegration and early destruction of the neighboring tissues.

About 60 per cent. of the carcinomas of the nasopharynx occur in individuals between 40 and 60 years old. The average of those collected since the report of Laval is 40 years, and these are nearly equally divided as to sex. The youngest patients were a girl,[6] aged 13 years, a boy,[9] aged 16 years, and a girl,[10] aged 17 years. Included in the summary of Chevalier Jackson[11] there is one reported by Jackson in a woman, aged 23, and another in a boy[12] aged 14 years. There are several between 20 and 30 years old.

Judging from the number of these tumors which have been reported, it would seem to be a very rare disease. Moritz Schmidt, in over 30,000 patients with disease of the nose and throat, found none of carcinoma of the nasopharynx. Many others, who have had a very wide experience, have not recognized this tumor in any of their patients. It seems significant, however, that nearly half of the carcinomas, reports of which have been collected since the summary of Laval, have been diagnosed by two men, Compaired and Oppikofer, who like others had difficulty in recognizing the disease at first. It seems reasonable to think that perhaps these tumors are not so uncommon after all, and that if they were more often suspected they might be more frequently detected. Most of these tumors have naturally been reported by rhinologists rather than by general surgeons. The symptoms are based on respiratory disturbances, auditory disturbances and glandular enlargement. Many of the glandular enlargements encountered were at first considered as due to tuberculosis, and only subsequently developments cleared the diagnosis. In both of the reports which follow, the first diagnosis was tuberculous cervical lymphadenitis. In some instances the diagnosis was syphilitic lymphadenitis, due to an extragenital chancre in one, in others as a part of a general lymphadenopathy of syphilis. Antisyphilitic treatment was employed for nearly a year in one instance before the mistake was discovered. In 1908 there appeared a report of what G. Parlevecchio[13] designated "a case of aleukaemie lymphadeni of endotheliomatous nature." This was most certainly an example of carcinoma of the nasopharynx. There was no postmortem examination. The rhinologists have mistaken the disease for simple fibromas, hypertrophy of Luschka's tonsil, especially where there was infiltration and enlargement of the faucial tonsils, and deviations and hypertrophies of the inferior turbinated body. In most of these mistakes the fault was due to the failure to examine the patient properly, using palpation and posterior rhinoscopy.

By most authors it is conceded that radical surgical treatment is never indicated, but rather are repeated palliative procedures advised. No certain cure is recorded.

The following clinical histories and brief descriptions of the changes found on postmortem examinations have to do with carcinomas of the nasopharynx in two young patients.

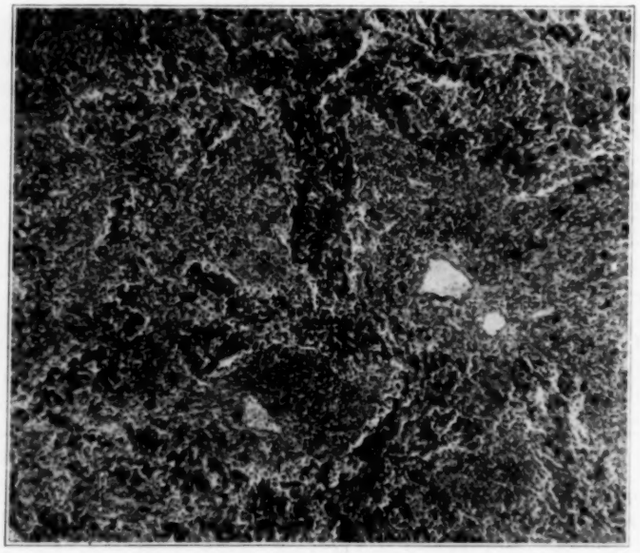

Fig. 1.—Photomicrograph (× 80) of a section from the vault of the nasopharynx (Case 1), illustrating the general arrangement of the rapidly growing carcinomatous cells, in many places closely set, with a tendency to form ductlike structures with open spaces for their lumina.

CASE 1.—*History.*—H. M. G., a physician and intern in the Cook County Hospital, aged 26, entered the Presbyterian Hospital of Chicago, March 17, 1909, with the following history: About fifteen months before he had noted that the cervical lymph glands were enlarged. Those first enlarged were at the angle of the jaw. These were always the largest, but the patient thought that they had decreased somewhat in size during the past six months.

The glands located lower down had gradually become palpable, particularly on the left side, where one was very prominent. The glands were never tender, and were always freely movable. The general health had been fairly good. The patient stated that he had had a subnormal temperature (from 97.2 to 97.8 F.) for about a year.

The past history otherwise was negative except for a severe attack of furunculosis over the back of the neck about four months before. At that time many glands which before were not palpable became enlarged, and many persisted. The immediate relatives were living and well, and there was no history of tuberculosis in the family.

On examination, the tonsils and thyroid gland were not enlarged. There was no exophthalmos. The glands along each sternocleidomastoid muscle were enlarged, but not adherent to the skin or to surrounding structures, and were not fluctuant. The glands were superficial and pea to hazelnut in size, those on the left the larger. The physical examination was otherwise practically negative. The leukocyte count of the blood was 8,250 per cubic millimeter, and the hemoglobin was 90 per cent. March 22, a differential blood count was made, which revealed: small mononuclears, 33 per cent.; large mononuclears, 11 per cent.; polymorphonuclear neutrophils, 49 per cent., and eosinophils, 7 per cent. A diagnosis of cervical lymphadenitis and periadenitis was made.

9. Baldwin, Kate: Malignant Growths of the Nasopharynx, Jour. Ophth. and Oto-Laryngol., 1908, ii, 12.

10. Guthrie, Thomas: Carcinoma of the Nasopharynx in a Girl, Aged 17 Years, Jour. Laryngol., 1911, xxvi, 449.

11. Jackson, Chevalier: Primary Carcinoma of the Nasopharynx, a Table of Cases, THE JOURNAL A. M. A., Aug. 10, 1901, p. 371. It is to be noted in reviewing the table of Laval that a number of the patients in whom these tumors occurred are not identical with those found in the table of Jackson.

12. Elder, J. M.: Report of a Case of Nasopharyngeal Carcinoma, Montreal Med. Jour., 1900, p. 900.

13. Parlevecchio, G.: Ein Fall aleukämischer Lymphadenie von endotheliomatöser Natur, Arch. f. klin. Chir., 1908, lxviii, 46.

March 18, Dr. Dean Lewis operated, removing the superficial chain of lymph glands on the left side and a few deep glands in the mastoid region and along the jugular vein.

The pathologic report made at that time was "hyperplastic tuberculosis (?)," though no giant cells were found.

The patient was discharged March 23, and returned again, Nov. 17, 1909. Operation was performed again, on both sides this time. Considerable periadenitis and scar tissue were found. Enlarged glands were enucleated from both sides, and part of the left sternocleidomastoid muscle was cut away.

A diagnosis of endothelioma of the cervical lymph glands was made from the histologic sections. At this time considerable bacteriologic work was done by Dr. E. C. Rosenow with material taken from the enlarged glands, with negative results.

The patient returned to the hospital from June 8 to June 12, 1910, to have some of the axillary glands removed, intending to have autogenous vaccines made. The blood examination at this time showed that there were 12,400 leukocytes per cubic millimeter, and 4,112,000 erythrocytes, with hemoglobin 70 per cent. (Dare). At the time of the writing of this history the clinical diagnosis recorded was "epithelioma of the glands of the neck."

Necropsy Report.—The patient died at his home, Aug. 19, 1910, and a postmortem examination was made about two hours after death by Dr. E. R. LeCount. The following description of the tumor and its extension was made:

"At the summit of a swelling opposite the angle of the left lower jaw there is a small surgical dressing covering a sinus surrounded by an elevated mass of yellow tissue almost spherical and from 3 to 3.5 cm. in diameter. The elevation is 1 cm. This growth is at the upper end of a scar which extends along the sternomastoid muscle a distance of 7 cm. The left eye is edematous and the left pupil is larger than the right.

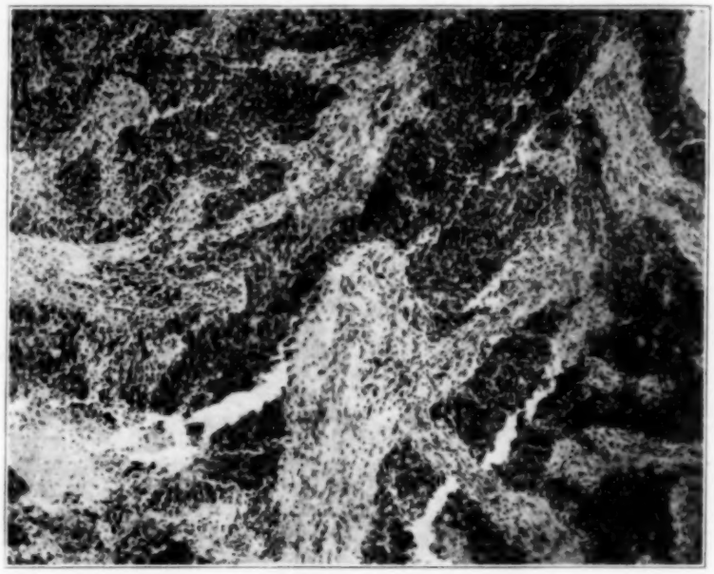

Fig. 2.—Photomicrograph (× 80) of a section from the posterior wall of the nasopharynx (Case 2). The arrangement of the cells, forming open spaces surrounded by closely placed epithelial cells, acinar and tubular structures, is better illustrated than in Figure 1. There is relatively much more of the tumor tissue.

"On dissecting the skin and muscles laterally from in front of the left clavicle, a lymph gland-like mass is found in front of the left clavicle, 2 cm. long and yellowish, firm and with a structure similar to that of other glands or tumor masses described in the following. A milky fluid escapes from the growth on the left side of the neck in dissecting the skin away from it.

"As the skull is opened, large amounts of clear colorless cerebrospinal fluid escape. After the brain is removed there is noticeable a swollen hypophysis cerebri, and a widening of the sella turcica. Also it is evident that the apices of the orbital cavities are filled not only with the vessels and nerves which normally pass through this region, but also by tumor tissue similar to that encountered in the neck. From either side of the sella turcica soft tissue projects so that from margin to margin transversely measured the distance is 3 cm. In the roof of the pharynx is a mass of soft tissue the color of yellow wax and quite uniform in appearance. The tissue is continuous with the mass that lies in front of it and the sphenoid bone. This tissue has apparently filled up the foramina at the apices of the orbital cavities, as stated.

"The epiglottis is edematous and thick. The left side of the glottis in the aryteno-epiglottidean fold is 1 cm. thick and soft and jellylike. Edema is less marked on the right side. On the left side the posterior and lateral wall behind the tonsil is also thickened and jellylike. There is no erosion of the mucosa in this region. The tonsil on the left side is enlarged and rounded, and projects a centimeter. It is 2.5 cm. long. This also has no erosion of the mucosa. The opposite tonsil is somewhat enlarged. There is an edema of the right side of the pharynx behind the tonsil, but less than on the left side. The tongue and submaxillary glands on both sides are unchanged.

"The glands in the left axilla form a mass approximately as large as a hen's egg. Some are adherent. The largest mass of them is 5 cm. long. On section the tissue is yellowish-gray and mottled with yellowish minute regions 3 to 5 mm. in diameter. Most of the glands are 2 to 3 cm. in their longest diameters.

"In the site of the operation there is a hard thick mass just to the left of the thyroid gland, which also is the size of a hen's egg and very firm. On the right side along the carotid artery there are a few enlarged lymph glands, none of them over 2 cm. long. On section one of these is considerably softened. There is no change in the larynx or upper portion of the trachea except for edema. The left vocal cord is twice as large as the right.

"In pieces removed from the very roof of the pharynx, the mucosa is swollen, edematous and the seat of an ulcer twice the size of the thumb nail, and the margins of the ulcer are markedly elevated."

Anatomic Diagnosis.—The other changes are indicated in the anatomic diagnosis which follows:

"Primary ulcerating carcinoma of the roof of the nasopharynx; metastatic growths in the lymph glands and tissues on the left side of the neck, lymph glands in front of the left clavicle, axillary and right carotid lymph glands; extension of the nasopharyngeal tumor into the sella turcica, about the hypophysis cerebri and into the orbits; marked edema of the brain and leptomeninges, left side of the face and neck, left eyelids, epiglottis, tonsils, pharynx, larynx, upper portion of the trachea, nasopharynx and mediastinal tissues; dilated left pupil; scar from a surgeon's incision on the left side of the neck with a sinus at its upper end; moderate emaciation; slight hypostatic bronchopneumonia; hypostatic hyperemia and edema of the lungs; slight hyperplasia of the tracheobronchial lymph glands; small tuberculous ulcer of the ileum; moderate hyperplasia of the mesenteric lymph glands, slight of those about the pancreas; hyperplasia of the spleen with passive hyperemia and hypostasis; passive hyperemia of the liver and kidneys; retention cyst of the left kidney; slight fatty changes in the lining of the aorta; moderate coal-dust pigmentation of the tracheobronchial lymph glands; flat chest.

"The histologic examination of tissues taken from all of the viscera and various parts of the tumor confirmed the gross diagnoses. In sections from various portions of the roof of the pharynx, the larger part of the sections consists of white

fibrous and lymphoid tissue. Small islands and strands of cells fill the lymph sinuses. These cells are from 15 to 20 microns in diameter, have a very small amount of cytoplasm, do not produce fibrils or other intercelluar substance, have vesicular moderately basophilic, granular and nearly spherical nuclei, and in some fields several contain mitotic figures, as many as four to eight to one field (objective 7, and ocular 1 inch). An occasional atypical mitosis or multipolar cell (from two to three mitoses) is found. In portions of the pharyngeal roof where the lymphoid tissue is most abundant, tumor cells are so arranged in islands and cords (Fig. 1) that they resemble glands and ducts. Where the groups of such cells are large, necrotic and poorly staining cells form the central mass. Very little stroma is present among the tumor cells. Similar conditions are present in pieces of tissue removed from the upper part of the sternomastoid muscle, from the lymph glands adjacent, and from those lymph glands above the thyroid isthmus, those at the right side of the thyroid cartilage, in the left axilla and in front of the left clavicle. No tumor metastases are found in any of the viscera.

Case 2.—*History.*—S. S., an Italian schoolboy, aged 9 years, was admitted to the Presbyterian Hospital, April 15, 1910, with a history of bilateral enlargement of the glands of the neck, present for the past two months at least and with an insidious onset. The previous history was otherwise negative. On examination the conditions recorded were poor body nourishment and ill development, and anemic appearance, marked enlargement of the cervical lymph glands, more marked on the left side where some fluctuation was present, palpable axillary nodules and barely palpable inguinal lymph glands. The eyes were rather prominent, the pupils normal, the ears negative, but there was marked obstruction of the nose, and the breathing was entirely oral. The tonsils were considerably enlarged, protruding and full of crypts containing cheesy pus. The pharynx was injected. The physical examination beyond this was negative. The leukocyte count was 20,000 per cubic millimeter, and the hemoglobin was 80 per cent. (Dare).

Tonsillectomy and adenectomy were performed. After that an incision was made along the left sternomastoid, the enlarged glands dissected out, and the wound closed without drainage. Great care was necessary, as the glands surrounded the internal jugular vein in places.

A diagnosis was made of "malignant adenitis (cervical), bilateral." The pathologic report on the pieces removed was "carcinoma (?). Sections were very suspicious of malignancy."

The patient was discharged, May 19, and returned, July 18, with still more marked enlargement of the cervical glands, which were at times painful. Again the diagnosis of epithelioma of the glands of the neck was made, and Roentgen-ray treatment was advised. The temperature was practically normal. The blood contained 5,232,000 erythrocytes and 18,050 leukocytes per cubic millimeter. The hemoglobin was 98 per cent. (Dare), and the differential leukocyte count gave small mononuclears 14 per cent., large mononuclears 7 per cent., polymorphonuclear neutrophils 76 per cent., and eosinophils 3 per cent. The first time the patient was under the care of Dr. A. D. Bevan, the last time under that of Dr. Dean Lewis.

Necropsy Report.—April 3, 1911, the boy died, and a postmortem examination was made on the same day by Dr. E. R. LeCount. The following are the essential changes found: The body was poorly nourished and greatly emaciated, the skin very pale, the eyes slightly protruding, the pupils equally dilated, the face swollen and hard, and the neck greatly thickened, especially on the left side where the circumference was nearly as great as that of the head. The thickening extended down uniformly to the axillary line. The thickened part was hard and firm. "On the left side of the neck the skin is dark gray, and about 3 cm. below the left ear there is an irregular hemispherical white protruding tumorlike mass, about the size of an English walnut. This mass is hard and has a rough surface. Around it and separated from it by what appear to be surgical scars are several smaller nodules, from 1 to 3 cm. in diameter, but in all other respects similar to the larger mass. Hard tumorlike nodules, about the size of hazelnuts, are palpable in both axillary cavities. . . . The tongue, the tonsils and the uvula are pale but normal; the entire nasal cavities are irregularly thickened by a white firm tumorlike mass. The soft palate is also included in this thickening. The pharynx and esophagus are free from pathologic changes, but with the other organs of the neck are embedded and covered by a white firm tumorlike mass. No traces of muscles can be found. After removing a large part of these masses the thymus and thyroid are exposed. The thymus is a small flat body, 3 cm. long and 2 cm. wide. It appears to be full of the tumor invasions, and near its margin are several small distinct round nodules. The isthmus of the thyroid shows a hard white tumorlike mass; the left lobe is irregular, flat, with an indistinct margin and containing a few nodules of the white firm tissue. The vessels of the neck on the right side are embedded in a solid tumor mass, the size of a medium large apple. On removing the organs of the neck on this side the skin can be easily separated from the rest of the tissue, but on the left side it is hardly possible. The mass surrounding the vessels on the left side is the size of a man's fist, is firmly connected with the skin and has several tumorlike nodules, as above described, below the ear. After removal of the tongue and organs of the neck, a large portion of the inner nasal cavities was removed and found to consist of very irregular thickened and solid tumor masses."

Anatomic Diagnosis.—This is as follows: carcinoma of the nasopharynx; metastatic growths in the thyroid gland, thymus, cervical and axillary lymph glands; marked infiltration of the muscles and fascia of the neck by the tumor growth extension; dilated pupils; slight exophthalmos; marked emaciation; general anemia; scars on the neck from a surgeon's incisions; hydropericardium; left hydrothorax; slight hydroperitoneum; slight hyperplasia of the tracheobronchial lymph glands; slight nodular encapsulated caseous tuberculosis of the left lung; healed and calcified caseous tuberculosis of the mesenteric lymph glands; hyperplasia of the mesenteric lymph glands; slight submucous hemorrhage in the ascending colon; slight fatty changes in the lining of the aorta; coal-dust pigmentation of the tracheobronchial lymph glands; small accessory spleen; small accessory left suprarenal gland.

The histologic examination confirmed the gross diagnoses, and the general descriptions of the sections are very similar to those of the sections from the first tumor described. This was a more rapidly growing tumor than the first. There is less fibrous connective tissue through the glands and less necrosis of cells centrally located in large masses. The cells are grouped like those in the other tumor (Fig. 2) and are of the same kind.

Synthetic Ability and Lip Reading.—This "synthetic" ability seems to consist in a grouping activity of the mind, necessitated by the fact that the lip reader, though ever so expert, cannot clearly distinguish every word. One reason for this is that many words and syllables look alike—for example, *may, pay, bay.* Furthermore, the movements involved in making many letters cannot be seen at all—for example, *c, k, h, ng.* Another difficulty lies in the fact that many people speak rapidly and carelessly, thus obscuring many movements. A combination of these factors results in rendering it impossible for lip readers to see all that is being said. They see only isolated words and fragments of words. With these as a framework, they must construct a meaning. The ability to construct meaning by combining isolated fragments into a meaningful whole is what is designated "synthetic" ability. The opposite type of mental constitution is called "analytic." An "analytic" or literal-minded person is very accurate and insists on perfect apprehension before attaching meaning to an impression. It is generally agreed that this is an impeding factor in lip reading, and that those persons succeed better whose "synthetic" powers are most used.—H. D. Kitson, *Volta Review.*

TONSILLECTOMY *

JUSTUS MATTHEWS, M.D.
ROCHESTER, MINN.

Complete removal of the tonsil in its capsule with the least possible danger and discomfort to the patient is the cardinal requirement of any operation on the tonsils. The instruments used in our clinic are a syringe with extension barrel and curved needle, the Robertson knife, Richards forceps and Tydings snare. The tonsils and the mucous membrane immediately surrounding them are brushed with cocain (10 per cent.), and this is repeated in five minutes. After a like interval a solution of novocain (0.25 per cent.) with 1 minim of epinephrin per dram is injected into the connective tissue about the capsules. When the patient pales from the effect of the epinephrin, the operation is commenced. The tongue is depressed until the edge of the palatoglossus is prominent in the anterior pillar. Immediately behind the pillar appears a triangular depression, whose other side is the tonsillar portion of the plica triangularis, and whose base is the root of the tongue. The point of the knife is placed in this depression and swept upward in such a manner as to cut the mucous membrane and enter the deeper tissues between the capsule and the anterior pillar. The incision is continued upward until the superior pole of the tonsil is reached, when the knife is turned slightly and brought down between the capsule and the posterior pillar. While this incision is being made, the tissues are not fixed by the forceps and, as the knife follows accurately the line of least resistance, there is little or no danger of wounding the muscles surrounding the tonsil. This single incision is usually sufficient to free the superior pole so that it may be grasped by the forceps and drawn inward and downward. While the capsule is thus put under considerable tension, the fascia and muscle are pushed away from it with the flat surface of the knife. The process is continued until the entire surface of the capsule, including the insertion of the superior constrictor muscle, has been freed so that the tonsil is attached only at the lower aspect of the inferior pole. Then the snare is passed over the forceps and tonsil in such a manner that the free end of the loop engages the remaining attachment and the lymphoid tissue which appears on the folds of the mucous membrane below it.

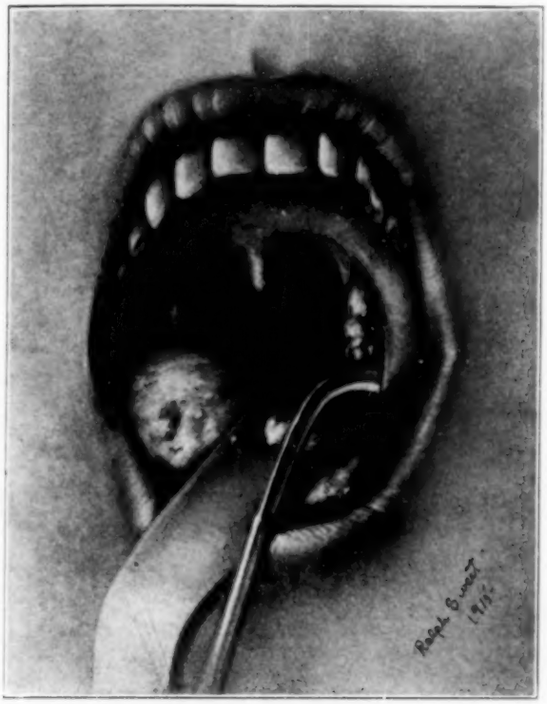

Fig. 1.—Point at which incision is made.

The lymphoid tissue should be carefully removed as it frequently contains crypts which are capable of furnishing the source of local and general infections. This point has been mentioned by Thayer and others, but does not receive the attention it deserves. Within the past year I have seen several patients who suffered from recurring sore throat from this source, and at least three patients in whom symptoms of rheumatoid arthritis persisted after tonsillectomy, but disappeared promptly after the excision of subtonsillar lymphoid follicles containing suppurating crypts.

The blood vessels entering the tonsil that are necessarily severed by tonsillectomy are much smaller than those in the fascia in contact with the capsule. The latter are liable to injury by the use of a sharp instrument when separating the tonsil from the peritonsillar tissues, but by the method described the fascia is pushed away with the flat surface of the knife and unnecessary hemorrhage usually avoided.

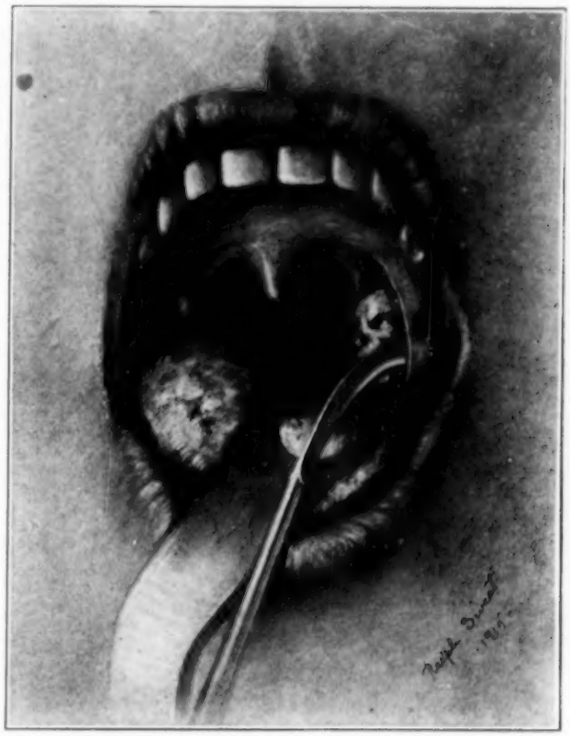

Fig. 2.—Condition of tonsil after incision has been carried up along anterior pillar over upper pole and down along posterior pillar.

During the operation, the tonsillar branches of the glossopharyngeal nerve are frequently seen as small filaments which emerge from the fascia and enter the capsule at one or more points while the main branches

* From the Mayo Clinic.

remain hidden by the superior constrictor muscle. This is the normal condition, but occasionally other filaments proceeding to the lower pharynx and the larynx of the base of the tongue may be seen. In rare instances, the entire terminal portion of the glossopharyngeal nerve pierces the superior constrictor muscle at the insertion of the stylopharyngeus, and thence to the base of the tongue lies in direct contact with the capsule of the tonsil. In this situation these nerves are liable to be cut during operations for complete removal of the tonsils, but are not within the field usually exposed by tonsillotomy. Here we find the explanation of the fact that vocal disability following operations on the tonsils has usually been associated with complete removal of the tonsils with little deformity, while shocking mutilations may be seen with no functional impairment.

I have recently seen a woman, operated on elsewhere one and one-half years ago, who came complaining of discomfort and dryness in one side of the pharynx, and difficulty and rapid fatigue in speaking or singing. Several laryngologists had reported the operative results perfect and, as on first observation the tonsillar fossae were clean, my opinion agreed with theirs. The muscles of the palate, pillars and tongue were uninjured, and there was a minimum of scarring. On subsequent observation, however, I found on one side the root of the tongue depressed, the muscular action impaired and the papillae and mucous membrane noticeably atrophied. As only loss of innervation could cause such changes, and as the symptoms followed were the results of tonsillectomy, there is little doubt that the terminal branches of the ninth nerve were severed. This patient's complaint was typical, and it seems reasonable to assume that others have suffered from the same cause.

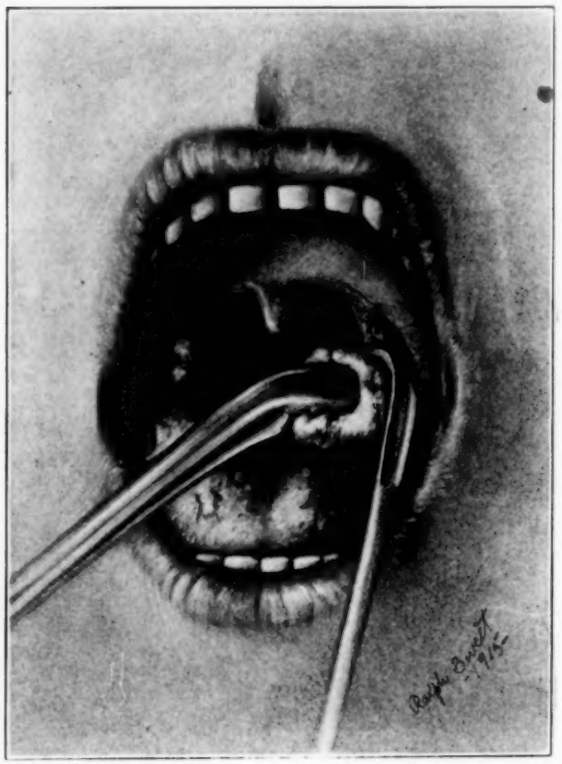

Fig. 3.—Forceps grasping over superior pole and drawing tonsil into pharynx. Knife pushing deeper fascia away from capsule.

One tonsillectomy patient of my own, and one who had been operated on elsewhere and came under my observation, had clean tonsillar fossae and no visible cause for pain; but they suffered with severe neuralgia in the nerves at the juncture of the palatoglossus muscle with the tongue. In a large percentage of cases a short section of the terminal portion of the glossopharyngeal nerve is exposed at this point and liable to injury on removal of the tonsil. Since no other lesions can explain the severe pain, I have concluded that such an accident is the probable cause and have recommended, though without opportunity of trying it, injection of alcohol into the trunk of the nerve.

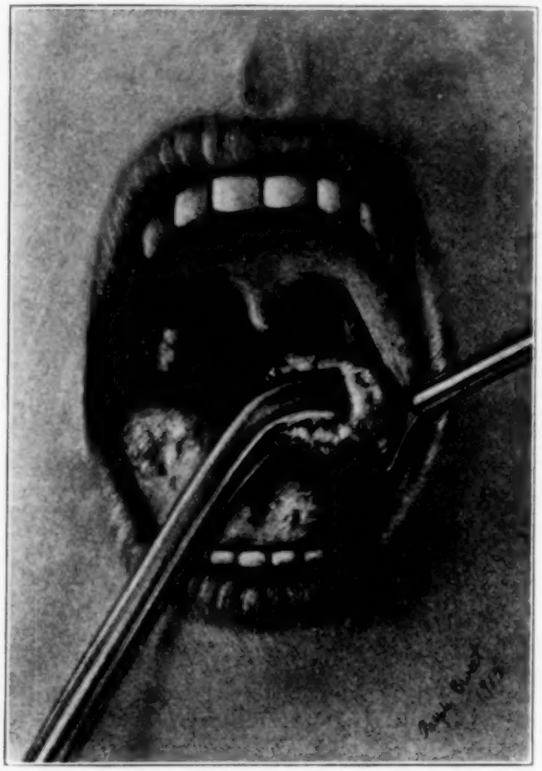

Fig. 4.—Snare passed over tonsil and forceps to separate mucous membrane and lymphoid tissues below inferior pole.

TRICHINOSIS

REPORT OF A CASE WITH TRICHINA LARVAE IN THE SPINAL FLUID *

ARTHUR R. ELLIOTT, M.D., CHICAGO

The case here reported furnishes a timely confirmation of a similar observation by Leon Bloch (THE JOURNAL, Dec. 18, 1915, p. 2140), and adds one more to the few recorded instances of the identification of trichina larvae in the spinal fluid.

History.—M. B., a schoolgirl, aged 14, was admitted to the medical service of St. Luke's Hospital, Nov. 23, 1915, complaining of sharp pains in the abdomen, of headache, alternate diarrhea and constipation, fever and marked muscular soreness.

November 12, the child first complained of malaise, and her mother observed a distinct puffiness about the eyes which became worse, lasting altogether for about one week. November 14, there developed general soreness of the muscles with a temperature of 102 and diarrhea lasting several days. An early symptom was cough with a good deal of pain and soreness in the costal region. November 21, she awoke from

* From the medical service of St. Luke's Hospital.

sleep with severe pain in the abdomen and vomiting. More or less vomiting, diarrhea alternating with constipation, persistent muscle soreness on movement and pressure, and continuous fever characterized her condition until admission to the hospital.

The patient states that she ate some roast pork at home, October 31, and that other members of the family also ate it, but that none of them have since been sick. She went to school all of the following week but did not feel well. She cannot remember whether or not she had any pain or diarrhea. The following Sunday, November 7, she was nauseated and vomited, and on Monday had some diarrhea. The patient's mother states that during the week following October 31 her daughter ate a pork chop, and remarked while eating it that it was not well done. Investigation of the condition of other members of the family during the period of the patient's stay in the hospital failed to reveal any other case of illness.

Examination.—The patient was well nourished and normally developed. Apparently the degree of illness was moderate. The skin was hot to the touch, and there was no edema, cyanosis or jaundice. From fifteen to twenty rose spots were present on the abdomen. The muscles were well developed and strong. There was a general tenderness of the muscles. The joints showed some restriction of movement, especially at the hips. There was no evidence of joint inflammation. The Kernig sign was present, probably because of pain in the hips. The organic condition of lungs and heart appeared normal on examination. Blood pressure was: systolic, 120; diastolic, 72. The tongue was moist and coated. There was no herpes or mucous lesions. The abdomen was somewhat painful to palpation, but without rigidity. The thyroid was slightly enlarged, and epitrochlear axillary, cervical and inguinal glands were palpable but not enlarged. Mouth temperature on entrance was 101 F.

A blood examination at this time revealed: erythrocytes, 3,520,000; hemoglobin, 58 per cent.; leukocytes, 21,000. The differential count was: neutrophils, 69; lympocytes, large and small, 9; eosinophils, 22. The Widal test was negative.

Subsequent cell counts, December 20 and 27, showed 26 and 14 per cent. eosinophils, respectively. The urine analysis was normal and remained so throughout.

December 3, 10 c.c. of clear, normal looking spinal fluid was withdrawn under moderate pressure. Three actively motile trichina larvae were found in the specimen. The cell count was 3 per cubic millimeter.

A section of muscle fibers was removed and examined for trichinae, but none were found.

The patient was discharged from the hospital in a satisfactory state of convalescence, December 29.

30 North Michigan Avenue.

Mars and Hygeia.—Mars and Hygeia have been sworn enemies since the world began. Pestilence and famine are the twin children of war.—J. H. Landis.

New Instruments and Suggestions

PILLAR-COMPRESSION FORCEPS

FOR CONTROLLING HEMORRHAGE FOLLOWING TONSILLECTOMY

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Attending Oto-Largngologist, St. Joseph's Hospital

In many cases of tonsillar disease, especially in the frail anemic patients with cardiac and rheumatic complications—just the types that most urgently require tonsillectomy—one hesitates before causing any further loss of blood. Believing that a flagrant violation of a vital principle occurred every time a needless amount of blood was lost, especially as so frequently occurs following the tonsil operation, I early became interested in the principle of bloodless tonsillectomy. The indications being marked, the tonsils are to be removed with little or no loss of blood; frequently the scales may be tipped in the wrong direction by the loss of an extra avoidable few ounces of blood: avoidable, because the technic described proves that loss of blood is *not* necessary during any tonsillectomy.

Various methods have been employed to stop bleeding immediately following tonsillectomy. The objections against one are the objections against all, namely, the severe reaction caused by manipulation within the tonsillar fossae. The application of hemostatic substances, such as Monsel's solution, epinephrin, hydrogen peroxid and alcohol, produce more or less sloughing, fibrinous exudation or marked infiltration. No better results are achieved by the hemostatic clamp, which produces pressure in the fossa by means of a gauze plug. Likewise the suturing of the pillars over a gauze plug, while it avoids the firm pressure of the clamp, produces marked reaction of the tissues. Ligation of the bleeding point, after it has been seized by artery forceps, results in trauma to the part and necrosis of the tissues if too much has been included in the original bite of the forceps, to say nothing of the trauma done to the area by frequent bites of the forceps before the bleeding point is seized, and the great difficulty of performing ligation in this site. As for suturing the pillars without the insertion of a gauze plug into the cavity, while this is nearer the ideal than any of the other methods, it produces trauma to the part with subsequent reaction, both at the time of insertion and at the time of withdrawal of the sutures.

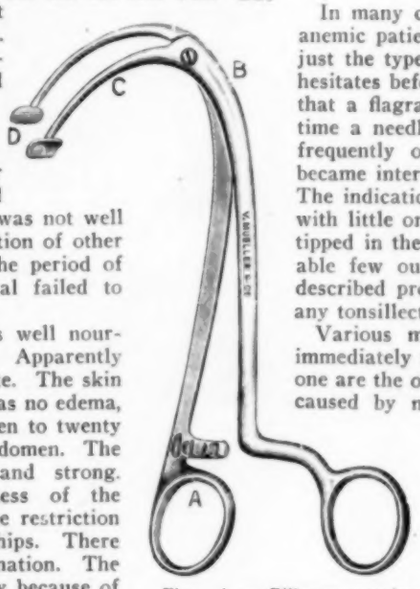

Fig. 1. — Pillar-compression forceps: *A*, handle; *B*, lock, *C*, goose-neck shank; *D*, compression tips.

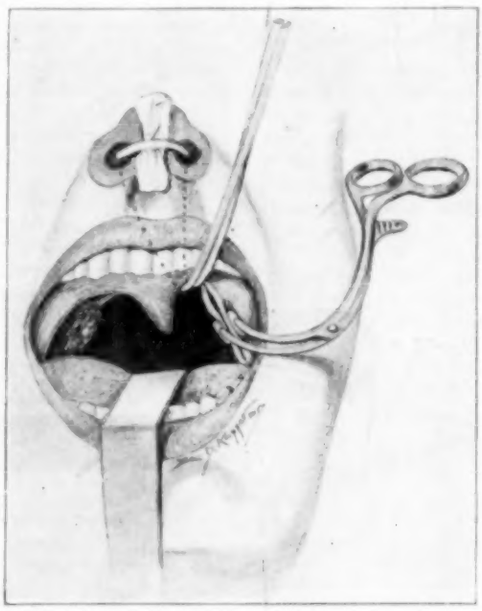

Fig. 2. — Pillar-compression forceps in situ on left side; no obstruction to removal of right tonsil.

To overcome these objections, and to control effectually the primary bleeding, pillar-compression forceps (Fig. 1) have been devised to squeeze the pillars together over the tonsillar fossa (Fig. 2). At the same time, this procedure protects the fossa from manipulation and the introduction of foreign substances. A surgically clean cavity is left unhandled, as a result of which there is no trauma to the parts and relatively little reaction; at least, less than occurs following manipulation in the fossae.

The instrument herewith illustrated (Fig. 1) which is used to squeeze the pillars together over the tonsillar fossa (Fig. 2) after the tonsil has been enucleated, consists of *(A)* a handle; *(B)* lock; *(C)* goose-neck shank, and *(D)* compression tips. The lock is so constructed that the compression can be regulated to suit the needs of the case; for

instance, only slight compression can be made and the bite held firmly, or, if this does not suffice to control the bleeding, the forceps can be closed more tightly. The goose-neck shank is so constructed as to keep the handles outside of the cheek while the forceps are in place. The compression is made by two corrugated tips, flanging slightly at the end, thus better regulating the degree of pressure exerted over the pillars. The area covered by the compression is one-eighth by three-eighths inch.

After removal of the tonsil, the curved compression forceps are applied high up, so as to compress the vessels in that area of the tonsillar fossa, the posterior blade being against the posterior surface of the posterior pillar, while the anterior blade fits against the anterior surface of the anterior pillar. The point of most importance is to pass the compression tips to a sufficient distance toward the lateral wall of the throat, so as to include in the bite (*a*) that portion of the posterior pillar next to the constrictor of the pharynx, (*b*) the floor of the tonsillar fossa and (*c*) that portion of the anterior pillar next to the mucosa of the cheek. While not absolutely necessary, the application can be facilitated by pulling forward the soft palate by means of the soft catheter previously passed through the nostrils and out of the mouth (Fig. 3).

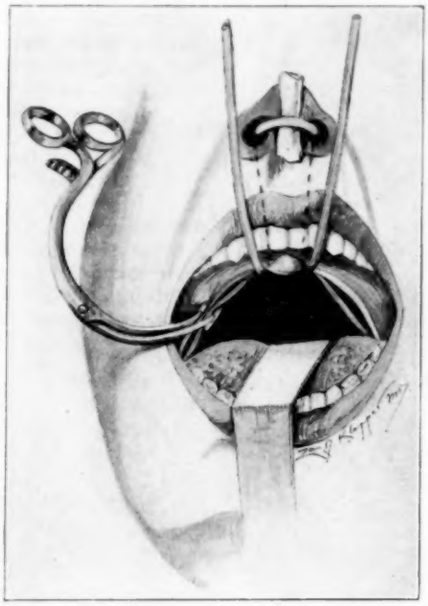

Fig. 3. — Pillar-compression forceps applied to right side; no hindrance to removal of adenoids.

Unless care is exercised in adhering to the foregoing technic, there will be included in the bite only the internal borders of the pillars without any of the floor of the tonsillar fossa (Fig. 3). Of course the superficial bite will not stop bleeding from the depth, as there will be no pressure exerted on the vessels in the fossa. As a result there will be a ballooning out of the pillars under which oozing will continue. If bleeding occurs from the bottom of the fossa, the straight forceps (Fig. 4, made on the same principle except that the shank is straight), are thus applied over the lower portion of the fossa. After a few moments the forceps can be removed or left on until the opposite tonsil or adenoid tissue is removed. If the bleeding recurs, it is a very easy matter to readjust the forceps and leave them in place a few moments longer.

The same results can be obtained in controlling a secondary hemorrhage, and a factor of great importance is that the pillars are in no way injured by the force of the compression, so that should

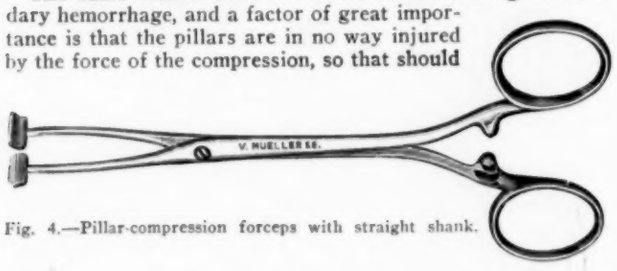

Fig. 4.—Pillar-compression forceps with straight shank.

it be necessary to introduce a suture or two for the purpose of obtaining a more prolonged compression of the fossa, this can be done without the fear of their tearing out because of previous interference with the vitality of the tissue.

104 South Michigan Avenue.

Selection Necessary for Race Betterment.—Abundant well balanced nourishment and thorough culture of plants or animals will always produce good results in holding any species or variety up to its best hereditary possibilities, beyond which it cannot carry them, and lacking which, maximum development can never be realized.

APPARATUS FOR USE IN BLOOD TRANSFUSIONS, SALVARSAN ADMINISTRATION, ASPIRATION, ETC.

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There are numerous apparatus devised for blood transfusion, aspiration of fluids, salvarsan administration, etc. A single apparatus, however, which may be used for all these purposes with a marked degree of efficiency is certainly very desirable. I feel, therefore, that no excuse is necessary for bringing forward this new apparatus.

DESCRIPTION OF APPARATUS

It is composed of a large record syringe, from 30 to 50 c.c. in capacity, capable of producing a vacuum in both chambers (1) and (2), depending on whether the plunger (3) is respectively pulled or pushed. This is made possible by the metallic cap (24) fitting air-tight around the piston of the plunger at 11 and containing the additional nozzle (13). The syringe, therefore, has two nozzles, one at each extremity, nozzle 12 communicating with chamber 1 and nozzle 13 with chamber 2. The four flow stopcock (8) having four openings (16, 17, 18 and 19) allows the two-way flow to go on at the same time. A piece of rubber tubing (14) connects opening 16 with nozzle 12, tubing 15 connects opening 19 to nozzle 13, tubing 20 connects opening 18 to the vein of the recipient by means of a cannula, and tubing 21 connects opening 17 with the vein of the donor by means of a cannula. By means of elevation 6 in the rod (5) which is attached to the handle of the plunger (7), the four flow stopcock is made to rotate automatically so that fluid entering the opening (17) will leave through opening 16 into tubing 14, and fill chamber 1 of the barrel through nozzle 12. At the same time fluid in chamber 2 will be pushed out through nozzle 13 and enter opening 18 into the recipient, provided the plunger (3) is pulled and a vacuum is created in chamber 1. If the plunger is pushed and a vacuum is created in chamber 2, fluid will enter opening 17, and the four flow stopcock working automatically by means of an elevation at the distal

Fig. 1.—Side view of apparatus, unconnected by rubber tubing; it can be readily taken apart for cleaning purposes.

end of the rod (5) will turn the four flow stopcock so that fluids will enter opening 17 and leave by means of opening 19 through tube 15 into nozzle 13 and fill up chamber 2. At the same time fluid in chamber 1 will be expressed through nozzle 12, through tube 14, enter opening 16 of stopcock, and leave through opening 18, into tube 20, into the vein of the recipient; 22 acts merely as a guide for rod 5.

HOW TO WORK APPARATUS

For Blood Transfusion—Indirect Method.—Remove all air from apparatus and fill it with normal saline. This can be readily accomplished by allowing saline to enter through tubing 21 and aspirating the saline into chamber 1 by pulling on handle 7. This will bring plunger 3 in opposition to the

cap (24). Pushing on handle 7 will now turn the stopcock, and saline will fill up chamber 2, and at the same time will expel the saline from chamber 1, emptying through tube 20. When chamber 2 and all the tubings and openings are filled with saline, the cannulas are placed into the veins of the recipient and the donor in the usual manner. The apparatus is now operated as an ordinary syringe, pulled and pushed respectively by handle 7. The blood will flow into chamber 1, at the same time expelling the saline in chamber 2 into the vein of the recipient, when the handle (7) is pulled and a vacuum is created in chamber 1. When the handle (7)

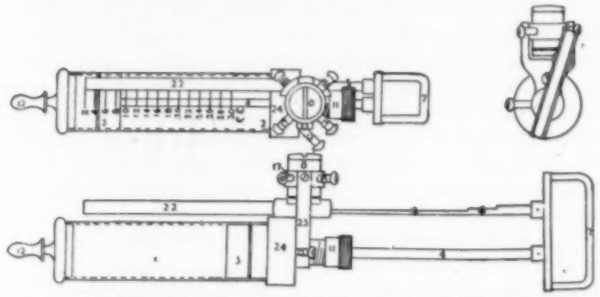


Fig. 2.—Working drawing of apparatus with plunger in (left upper figure); plunger out (lower figure); plunger in, and viewed from handle in front (right upper figure).

is pushed and a vacuum created in chamber 2, the blood of the donor will flow into chamber 2, at the same time expelling the blood of chamber 1 into the vein of the recipient. It will thus be seen that the flow is continuous, entering either chamber 1 or 2 through the donor, and is simultaneously discharged from the opposite chamber into the vein of the recipient.

Thus there is a continuous flow, uninterrupted from the donor to the recipient, which materially inhibits clotting. The barrel of the syringe being graduated, the quantity of blood transfused can at once be estimated. Further to inhibit clotting of the blood, it is advisable to subject the entire apparatus to ether spray during the transfusion, as first pointed out by Dr. Elsberg of Mount Sinai Hospital. The entire apparatus can be readily sterilized by boiling water, steam sterilizer, or autoclaving, and can be very readily taken apart and thoroughly cleaned. If the citrated method is used, the receptacle containing the blood becomes the donor. Otherwise the method is the same.

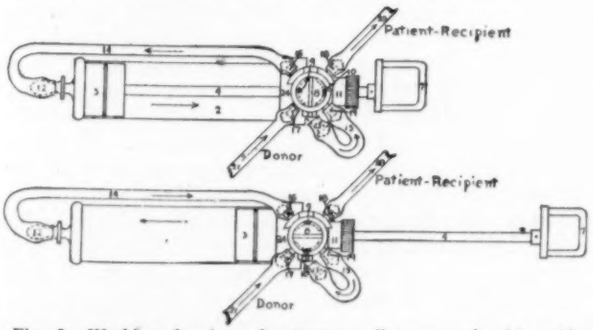


Fig. 3.—Working drawing of apparatus all connected with rubber tubing with plunger in (upper figure), and the handle (7) pulled on; the arrows indicate the flow of the fluid; with plunger out (lower figure), and the handle (7) pushed on; the arrows indicate flow of fluids. The four flow stopcock works automatically.

For Aspiration Purposes.—Irrespective of the quantity or the location of the fluid, the needle connecting with tubing 21 is plunged into, say, the pleural cavity, which becomes the donor, and the fluid is emptied out into a receptacle, leaving the apparatus through tubing 20. No previous filling of apparatus with saline or emptying of air is of course necessary. Since no air can possibly enter the cavity, all chances of infection are avoided.

For Salvarsan Administration.—The same precaution of filling with saline and emptying of air should be taken as for blood transfusion. Tubing 21 is placed into a prepared solution of salvarsan which is emptied into the vein of the recipient, the saline leaving the apparatus through tubing 20.

For loading accurately measured amounts of fluids such as antitoxins, vaccines, etc., into containers, this instrument can be used to good advantage. The principle is the same for whatever purpose it is applied.

Dr. William F. McKenna has suggested using two syringes, the handles of pistons connected with a walking beam. The nozzles of syringes are connected with a four flow stopcock, thus allowing the simultaneous aspirations of blood into one syringe and the expulsion of blood from the other, in other words, having two separate barrels of two syringes, instead of the barrel of one syringe for both chambers.

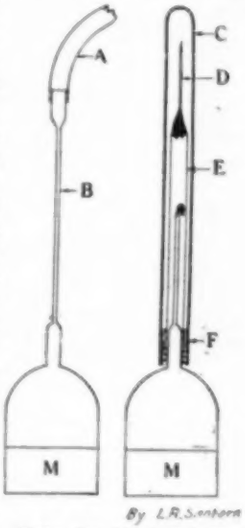
1352 Carroll Street.

A SIMPLE METHOD FOR BLOOD CULTURES

PAUL G. WESTON, M.D., WARREN, PA.

The simple device here illustrated has been used by me for some time. The tubes are easily prepared, can be shipped through the mails and the medium lasts indefinitely.

An ordinary 10 or 25 c.c. vaccine ampule is half filled with the culture medium—bile, bouillon, etc. The neck is then drawn to a capillary tube, and by means of an air pump connected to the water line, a vacuum of 15 or 20 inches is obtained. The capillary tube is then sealed in the flame. A rubber tube with needle is attached, and this is covered with an outer glass protecting tube as in the Keidel blood collecting tube. The whole is then sterilized intermittently or in the autoclave. The moisture in the outer, protecting tube rapidly evaporates if the tube is inverted in a rack and placed in the incubator.



Tube for blood cultures: *A*, connection to air pump; *B*, capillary tube to be sealed in flame; *C*, outer protecting tube; *D*, needle; *E*, rubber tube; *F*, cotton; *M*, *M*, medium.

For use the needle is inserted into a vein and the capillary glass tube is broken. After the blood has been collected and the needle removed from the vein, the outer protecting tube is replaced and the tube is ready for shipment. No sealing is necessary, as a firm clot plugs the needle. I have sent one of these tubes containing normal blood in bouillon to San Francisco and another to Galveston, Texas. Both were returned to me, and both had remained sterile.

THIONIN AS A DIAGNOSTIC STAIN IN PYORRHEA ALVEOLARIS

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Instructor in Bacteriology and Preventive Medicine, University of Missouri, School of Medicine

I have seen no mention in the literature on endamebas in pyorrhea alveolaris of the use of thionin as a diagnostic stain for the endameba. In the past fifteen months while doing microscopic work for several dentists in this city, it has been my privilege to examine a large number of slides of alveolar exudate for endamebas and other organisms. Most of the preparations were stained before being examined, and the stain used in the majority of cases was thionin. The stain was prepared according to the following formula:

Thionin	0.5 gm.
Distilled water	100.0 c.c.
Phenol (carbolic acid) crystals	2.0 gm.

This solution must be prepared fresh every three or four months.

To prepare the slide, a smear is made of the exudate as with other pus and dried in the air. The smear is then fixed in the flame and stained a few seconds while still warm with the thionin solution. The stain is washed off with water and the slide dried. It may be mounted in balsam with a cover glass, or examined direct in immersion oil as desired. The endamebas are stained quite distinctly by this method. The cytoplasm is stained a light purplish violet and the nuclei a deeper reddish violet. Ingested blood corpuscles and other material undergoing digestion in the body of the organism are stained nearly black. The pus cells in the smear are stained a light blue, with their nuclei a deeper blue. Bacteria are also well stained, the fusiform bacilli and spirillas being especially plain. The endamebas stand out quite distinctly in the smear, and are easily recognized. A person accustomed to the use of the microscope can usually see them easily with the low power (two-thirds or 16 mm.) objective, using the high power only for verification; hence a considerable area of the smear can be covered in a short time.

I have found the stained preparations much more reliable than unstained preparations, and much quicker, on account of the time consumed in examining an unstained slide. Thionin has also given more uniform results than the double staining method with fuchsin and methylene blue, and the stain is made more quickly and easily.

This stain does not give good histologic pictures of the endamebas, and is recommended only as a diagnostic stain, for which purpose it gives very plain pictures of both the endamebas and the bacteria.

Special Article

WHAT THE CIVILIAN DOCTOR CALLED TO ACTIVE SERVICE WITH THE ARMY SHOULD KNOW

(*Continued from p. 426*)

II. DUTIES ON THE LINE OF COMMUNICATIONS; SANITARY MEASURES IN CAMPS

In comparatively recent times, as the result of progress in medicine itself, the scope of the duties of an army surgeon have been greatly extended. These are in the direction principally of sanitation and administrative lines. Both in mobilization camps and in the camps made by an army in the field, the same general principles relative to sanitation prevail. There is, nevertheless, considerable difference between stationary and permanent camps, such as the place where recruits are mobilized, and the camps that troops moving in the field make themselves. In the mobilization camp, if permanent in character, we may have, for instance, large storehouses or depots where supplies of food and clothing and fuel are readily obtained for issue; we may have a water supply distributed by a system of pipes throughout the camp, carrying water of known potability; we may even have a water-carriage sewage system, and certainly the surroundings of such a camp should give rise to no disease borne either by impure water or milk, or conveyed by insects such as mosquitoes and flies: in short, the only marked difference from a well conducted civilian community would be that the inhabitants of such a camp are living under canvas rather than in well constructed houses. On the other hand, during the Spanish war, permanent camps, such as have been described above, were far from being such healthy places. Mobilization camps may be unprovided with satisfactory water supply or systems of conservancy, and it then becomes the duties of the medical officers to recommend suitable systems and to inspect the working of them in order that the health of the troops may be maintained. What applies to a mobilization camp under such circumstances applies equally to a camp of troops living in the field whether in their own or the enemy's country.

Of great importance is the selection of a proper site for a camp. There are a number of factors instrumental in affecting the salubrity of a camp site. In the field this matter is determined by military exigencies. In mobilization and concentration camps the matter is within control of the authorities, and properly informed persons should be the ones entrusted with the selection of such sites. As these matters are determined by others than the newly commissioned officers, they will not be taken up here, important as they are.

All information must be gathered about the water which is to be used for drinking purposes. Indeed, when practicable, this information should be obtained prior to the time that troops will require to use a certain supply of water. If the water is potable, the source of the supply must be protected from pollution; if it is questionable in quality, proper measures must early be taken to render it safe for drinking purposes. Briefly, these are the guarding of the source from further pollution: treating of the water by boiling, filtering, or sterilizing with special field appliances, as conditions indicate.

The next important measure is the prompt installation of a method of disposal of camp wastes. Wastes from the kitchens may either be burned or removed. Most important and most difficult is the method of disposing of human excreta. Measures to accomplish this have been very thoroughly and satisfactorily worked out since the Spanish war. Where there is no danger to water supplies, and the probable life of the camp is limited to a year or less, a trench system can be used which supplies a pit for each company or organization with a fly-tight box cover. The pit is burned out each day with crude petroleum and straw or some inflammable material. One should not labor under the false impression that the contents of such a pit are sterilized. Incineration of the sides of the pit and the bare surface of the contents lying on the bottom are the only effects this produces. The only results are the destruction of fly larvae and the deodorization to a certain extent of the pit and its contents. Furthermore, it darkens the surfaces with soot and thus makes it less likely to attract flies. The latrines of a modern camp, when exigencies of war permit it, are kept most scrupulously clean in order to prevent the spread through contact of typhoid and dysentery, and to give the fly no opportunity to carry the organisms of these diseases to the food. In permanent camps, incinerators have been used with complete satisfaction, though at some considerable cost for fuel in the disposing of human excreta. There are several types of these, and one of them is capable of destroying at the same time the garbage from the company kitchen. The details of the management of these appliances, as well as of the trench system of latrines, should be studied. Information on these subjects will be found in the military hygienes which are authorized for issue to medical officers of the National Guard, and in papers written by sanitary inspectors of the

large camps that the army has had in Texas for the past few years.[1]

Proper arrangements must be effected for maintaining the personal cleanliness of the men; in the field, time and occasion are mode for this purpose though even in the presence of the enemy. In France the troops are relieved at given periods in the trenches for the purpose of enabling them to bathe and change their clothing, as well as to obtain rest. These measures are especially important among recruits, and every mobilization camp should have a system of shower baths and a place where the men can wash their clothes themselves, even though some facilities for having them laundered may exist. Given a reasonably salubrious camp site, potable water, sufficient tents or other form of shelter, a system of conservancy by which the camp is kept unpolluted, effective measures for disposing of the manure from animals in and around the camp and thus preventing the development of flies, and opportunity for the men to bathe and wash their clothes, the health of a command should be maintained under these conditions almost indefinitely. The prevention of fly breeding in the collections of manure in every camp is a matter of great concern, and a satisfactory solution is described by some of the authors mentioned.

The foregoing measures in connection with the vaccination against typhoid fever and smallpox will confine the disabilities in a camp of mobilization largely to the injuries following accidents, venereal diseases, and to the inevitable measles and mumps. Diphtheria, tonsillitis and cerebrospinal meningitis may make their appearance, but in the absence of overcrowding are not a cause of serious concern.

So far we have dealt almost entirely with the duties of the recruiting officer and the sanitarian. We must consider briefly other duties of the medical officer in this zone or service of the rear. These are duties not with the soldier who is waiting to proceed to the front, but with the soldier who, having been at the front, has now returned, completing the circle, as it were. While in the home territory we have the camps of mobilization and concentration, recruiting, training and equipping new men who are to go to the front, we have in the same territory hospitals and convalescent camps occupied by men who have been at the front and who have been disabled by either wounds or disease. With them the duties of the medical officer are almost entirely of a professional character, and those who may have read that most interesting address of the late Dr. S. Weir Mitchell[2] have already grasped the character of the service. Briefly, we are dealing with two classes of soldiers: The first, and most important, are those men temporarily disabled who may through intelligent treatment be restored to health and returned to the colors for further service. It is in this field that, as far as we know to date, most marked advances have been made by the medical profession of the armies in conflict in Europe today; but to these hospitals in the rear come only the second class, the soldiers who have either been seriously incapacitated or whose disabilities are of such a nature that considerable time is required for them to be restored to health, and those who will probably remain permanent cripples. From the convalescent camps we expect practically all of the men to be able to return to the colors, because only patients who give such promise are usually sent to these camps. Besides the large general hospitals, there will be more numerous base hospitals accommodating about 500 patients each, and here are weeded out patients described above who are forwarded on to general hospitals, and those patients who give promise of early restoration to health, and in consequence of which will be promptly sent back to their regiments. These hospitals have a staff of about twenty medical officers. Besides being able to give skilful professional care, they must also have the experience to weed out the hypochondriacs and malingerers, who always appear in the wake of a large army. These hospitals are usually in buildings, public or private, suitable for the purpose, and in every way resemble civilian general hospitals of similar size. The organization of a suitable administrative force for such hospitals is no easy task, and cannot be improvised over night.

As the general sanitary measures necessary for the maintenance of the health of troops are much the same, whether in the zone of the interior or in the line of communications, or even in the zone of the advance, they have been dealt with as if the camps and hospitals mentioned above were all in the same zone. Let it be clearly understood that the medical officers of the concentration camps are almost invariably in the zone of the interior. In this zone are also found the general hospitals and some of the convalescent camps. In the territory covered by the line of communications are found the base hospitals at the base of this line, and the evacuation hospitals along the line and at its head; also rest stations and the camps of troops guarding the line and engaged in forwarding supplies and reserves.

Besides the sanitary duties which the medical officer must exercise in these camps will be the care of the sick and wounded passing along this line to the rear, or the zone of the interior. He will also be charged with the transportation of the wounded. Therefore, officers of administration capacity and experience in such work must be chosen to superintend the movement of the sick and wounded along this line. It will be readily appreciated that unless they are kept moving toward the rear, the hospital accommodations at the front and in the zone of advance will rapidly become clogged, resulting in a partial immobility of the field hospitals, and to a greater or lesser extent of the mobile army itself. It is along this line that much suffering and waste of life can be prevented by experienced and trained men. It is here, as well as in the zone of advance, that men trained in the administration of ambulance companies, hospital trains and rest stations will be indispensable. Assisting them must be many medical officers whose principal duties will be the care of the sick and wounded. In fact, where the evacuation of the wounded is ably managed, it has been found, in many instances in the present European war, that the first treatment, other than the emergency or first-aid, is given by the medical unit on this line, so rapidly are the wounded brought back when circumstances permit.

(To be continued)

1. **Havard:** Military Hygiene. Keefer: Military Hygiene. Mason: Handbook for the Hospital Corps. Ashburn: Elements of Military Hygiene. Woodhull: Military Hygiene for Officers of the Line. Straub: Sanitation of the Maneuver Camp at San Antonio, Texas, 1911. Miller: Sanitation of the Second Division, U. S. Army, at Texas City and Galveston, 1913.

2. Mitchell, S. Weir: The Medical Department in the Civil War, THE JOURNAL A. M. A., May 9, 1914, p. 1445.

Hygiene of Life.—To teach the people how to live is a problem of increasing importance to those who are working for the public health.—E. L. Fisk, *Am. Jour. Pub. Health.*

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SATURDAY, FEBRUARY 12, 1916

THE EFFECTS OF RADIUM RAYS ON PROTOPLASM

All of the claims which have been made with respect to the physiologic or pathologic effects of radioactive substances must ultimately be carried back to the effects of their radiations on protoplasm. Whether it be the growth of plants in the soil or the destruction of a neoplasm in the body that is involved, the primary reactive substance and responsive mechanism must be associated with living cells. It is reasonable, therefore, to turn to the unit of structure, the cell, in any fundamental inquiry as to the effects of a potent agency on the plant or animal body.

Of course, the other factor, the radiation itself, also deserves consideration. Of the three types of radiations given off by radium, the alpha rays, which are chemically the most active, are of secondary interest here because, owing to their slight power of penetration, they are absorbed by the containers in which the radium salts are ordinarily held, and accordingly do not reach the external object. The beta rays are not so readily absorbed, and are chemically much less active. The gamma rays are similar to the hard Roentgen rays in many respects. Rutherford, in fact, states that they are the more penetrating Roentgen rays. Since they are not absorbed to any extent, their effects may be of a different order from those of the beta rays. Richards,[1] however, believes that they differ in degree rather than in the kind of their action. The beta rays can be separated from the gamma rays in a magnetic field, inasmuch as the beta rays alone are deflected thereby.

Broadly speaking, slight exposure to radium in most cases accelerates the vital processes, while a more intense treatment retards or inhibits them. Also the effect of the retardation may be cumulative and persistent through many cell generations. Gager[2] believed that radium rays stimulate metabolism. "If this stimulus ranges between minimum and optimum points, all metabolic activities, whether constructive or destructive, are accelerated, but if the stimulus increases from the optimum toward the maximum point, it becomes an overstimulus, and all metabolic activities are depressed and finally completely inhibited."

While in this country the medical side of the problem has attracted more investigators than the biologic side, much work has been done abroad to establish the mechanism by which radium rays affect living matter. The hypothesis of Schwarz was that radium decomposes the lecithin in the cell. Oskar Hertwig, his son, his daughter and his pupils have performed many extensive series of experiments over a wide range of forms, the most significant conclusion which they draw being that radium affects, directly and chiefly, the chromatin of the radiated cells. Packard, basing his theory on the observation of numerous investigators that radium rays affect enzymes, suggests that "the lytic enzymes in the cell are more stimulated than those which play a synthesizing rôle." By activating autolytic enzymes which bring about a degeneration of the complex proteins, he believes, the radium radiations act indirectly on the chromatin and protoplasm. Richardson regards the lecithin hypothesis of Schwarz as "completely overthrown" by a number of arguments which were unknown at the time it was propounded. He also finds the chromatin theory of Hertwig unsatisfactory in that it fails to account for the fact that substances and structures other than nuclear are affected by Roentgen rays and radium. Against Packard's enzyme theory Richardson sees little objection to be urged except that it rests on insecure evidence, few actual observations or experiments having contributed to it.

In a recent paper, Packard[3] describes the results of study of the effects of beta and gamma rays on protozoa and on the egg cells of sea urchins and other low forms of life. He finds that cells differ from each other in susceptibility, apart from the fact that each cell seems to vary in susceptibility during different phases of its own activity. Some protozoa, like some bacteria, are entirely unaffected by long exposure to vigorous radiation, while others are killed by shorter exposure. In some the chromatin, in others the protoplasm, is chiefly affected. It is known that inorganic substances undergo ionization from radiation, but whether or not the cell changes are due to ionization of the constituents of the protoplasm remains to be decided. Packard believes that those cells which are injured contain substances which absorb the rays, while those which are unharmed allow the rays to pass through unchanged. The unknown factor is the material which determines the power of absorption. From a medical point of view the deduction is important that, until more is known about what causes the absorption as well as the penetration of the various

1. Richards, A.: Recent Studies on the Biological Effects of Radioactivity, Science, 1915, xlii, 287.

2. Gager, C. S.: Effects of the Rays of Radium on Plants, Mem. New York Bot. Garden, 1908, iv.

3. Packard, C.: The Effects of the Beta and Gamma Rays of Radium on Protoplasm, Jour. Exper. Zool., 1915, xix, 323.

radiations, it will be impossible to predict precisely what effect a given exposure to any type of radiation will produce.

It is to be hoped that before long the effects of radium from the biologic point of view may be better understood. This will pave the way for a more rational application of radium in therapeutics.

SPRUE

Sprue is a tropical disease of growing importance to American physicians. It has already been reported in our Southern states,[1] and imported cases seem to be becoming more frequent. Sprue in its clinical manifestations is similar to pellagra; some authors have even asserted that the two diseases are identical.[2] The cardinal symptoms of "typical" or "complete" sprue are usually given as stomatitis, a peculiar diarrhea, diminution in the size of the liver and secondary anemia with wasting. There are neither skin nor nervous manifestations. In pellagra, however, skin symptoms are often in abeyance, and nervous symptoms may be so slight as to be negligible. Reduction in the size of the liver, anemia and wasting are common to the two affections. Both diseases have been denied classification as morbid entities, being regarded rather as syndromes which may appear secondarily in many wasting affections.

One important difference between them is to be found in the character of the diarrhea, and more especially in the stool itself. In sprue the diarrhea occurs usually in the early hours of the day, the stool is voluminous, light in color, acid in reaction and of a foamy, gaseous character. In pellagra these characteristics are not observed. The chemical study of the stool, in the light of later studies, seems to be highly important in differentiation between the two diseases. The large size of the sprue stool is due to the lack of digestion and absorption of certain bodies, notably the fats. Wood[1] thinks that the only certain means of differentiating sprue from pellagra is the chemical study of the feces. Fatty stools with great fat and nitrogen loss, in his opinion, are characteristic of sprue, while in pellagra the fat and nitrogen absorption are about normal. This character of stool, it is to be noted, is also characteristic of pancreatic disease, and actual disease of this organ has been reported in some cases of sprue. The sprue stool is often lacking in pancreatic ferments, but this need not necessarily be due to organic changes in the pancreas, and may be caused simply by disturbed intestinal function. Further studies are needed to determine just what part lesions of the pancreas play in the diarrhea of sprue.

Sprue does not always appear in its "typical" or "complete" form. Bahr[3] speaks also of "incomplete" sprue characterized by the diarrhea alone, and of "tongue" sprue when only the mouth signs occur. These varying degrees of intensity are not so peculiar as they are confusing in diagnosis. The same difficulties are encountered in pellagra without erythema—pellagra sine pellagra.

The question of the etiology of sprue is in a most unsatisfactory state. The idea advanced some years ago that sprue is an infectious disease due to some variety of yeast has received new impetus from the studies of various authors, notably Bahr[3] in Ceylon and Ashford[4] in Porto Rico. Bahr's researches led him to express conservatively the opinion that the *Monilia albicans* is the cause of the disease. Many of his colleagues expressed their inability to accept as the causal agent a fungus common in England, where sprue does not occur. It is interesting to note that the *Monilia albicans* is the organism most usually found in the mouths of children suffering from thrush.

Ashford's studies seem to corroborate Bahr's evidence in all points save in the species of fungus involved. He regards the disease as a moniliasis due to an undetermined species, not heretofore described. Further, he believes that the infection is probably derived from bread. He has cultivated the organism from a loaf of bread baked in a zone where the disease was endemic. He has found it constantly present in the mouth lesions and feces of patients with sprue and in only 3 per cent. of healthy persons. Complement fixation tests, in which his monilia was used as antigen, have proved negative in healthy persons and encouragingly positive in those suffering from sprue. The monilia is pathogenic for small laboratory animals, producing a mycotic septicemia, and, in partially immunized animals intractable mycotic ulcers. These results, while highly interesting, are likely to be received with considerable skepticism. Much additional work and more definite evidence will be required to establish such a thesis.

In this connection it is perhaps somewhat discouraging to recall that the etiology of pellagra has also passed through a "mycotic" stage. Many have sought some etiologic connection between fungi and pellagra, both with and without relation to "spoiled" maize. Students of pellagra will recall the series of papers by Ceni, who contended that this disease was an aspergillosis—an opinion which, though supported by apparently excellent evidence, has remained unconfirmed.

Sprue, while rare in the United States, is a formidable disease in some places. Ashford reports that in Porto Rico during the last decade it has made startling advances, and "has now come to occupy a position in

1. Wood, E. J.: The Occurrence of Sprue in the United States, Am. Jour. Med. Sc., 1915, cl, 692.
2. Burnet, J.: Are Pellagra and Sprue One and the Same Disease? Med. Press and Circular, Aug. 16, 1911; abstr., THE JOURNAL A. M. A., Sept. 16, 1911, p. 1014. Stewart, C. E.: Tr. XVII Internat. Med. Cong., 1913, Section XXI, Tropical Medicine. Editorial, Jour. Trop. Med., Sept. 15, 1913.
3. Bahr, P. H.: Researches on Sprue, Tr. Soc. Trop. Med. and Hyg., 1914, vii, No. 5.
4. Ashford, B. K.: Studies in Moniliasis of the Digestive Tract in Porto Rico, Am. Jour. Med. Sc., 1915, cl, 680.

the very front rank of the serious and fatal affections of our island, especially dreaded by American residents, among whom it seems to be far more common and fatal than tuberculosis."

TRENCH FROSTBITE

Amid the numerous problems of medical and surgical interest raised by the experiences of the present European conflict, the cold season calls attention to "frostbite," especially of the feet, a condition which has had considerable prevalence during the peculiar trench warfare. In the classical picture of frostbite as it occurs after exposure to severe cold, any part of the body subject to the low temperature may respond with a condition which often results in severe destruction and disintegration. In a number of military campaigns a variety of gangrene, affecting especially the lower extremities, has been observed. Its occurrence has generally been attributed to cold, and for this reason the condition has been denominated frostbite. It is noteworthy, however, that in many of these outbreaks the disease manifestations have arisen when the external temperature, while many degrees below that of the human body, was still usually above the freezing point. Usually there has been a prolonged exposure to cold associated with immersion of the lower extremities in mud or water. The fact of the selective susceptibility of the lower extremities, in the case of trench fighting, has raised the question as to whether the external cold, as such, or the prolonged exposure to a moderate degree of wet cold, and the fact that the feet, more than any other part of the body, are apt to be compressed by their protective coverings, constitute the dominant etiologic factor.

In general, the extent of the lesions observed under the modern conditions has varied. There might be a simple erythema or blistering and excoriation of the cuticle, or superficial death of the skin, or gangrene of a greater or lesser portion of the limb. The effect of cold alone as exhibited in ordinary freezing of the tissues is fairly well known. Rischpler[1] has demonstrated that all of the phenomena under such conditions are due to inflammation caused by the cold. There is early edema; the cells in the walls of the vessels become swollen and degenerated; the bundles of connective tissue swell; the muscular fibers in the media of the arteries show vacuolization. There is little, if any, evidence that the effects can be attributed to thrombosis, except occasionally as secondary to the inflammation itself. Changes in the nerve fibers are neither marked nor constant.

In order to elucidate the etiology of the special type of disease known as trench frostbite and ascertain in what respect the possible factors aside from cold itself may influence the manifestations, an experimental inquiry has been instituted at the University of Edinburgh under the auspices of the National Insurance Medical Research Committee of Great Britain.[2] The effect of both cold and wet on the feet of animals was investigated under controlled conditions which permitted an appreciation of the appearance of swelling and of any histologic changes in the structures of the exposed limbs. It is clear from the results that the essential change in frostbite of the feet, when exposed to cold mud, consists in the damage to the blood vessels. There is probably an initial constriction of the vessels; but when this passes off it is because of their damaged condition that the swelling occurs while the circulation is being restored to the normal. The damage is evidenced by the swelling of the endothelial cells in vessels of all kinds, and by the vacuolization of the muscle fibers of the arterial walls, already noted as a characteristic effect of cold alone. An excessive amount of fluid consequently finds its way into the tissues, and in some cases the vessels rupture, and hemorrhage follows. There is, further, evident interference with the vitality of the cells of the surrounding connective tissues. Further indication of injury is seen in the infiltration of the parts with leukocytes and other phagocytic cells which have the function of removing products of tissue destruction.

The British investigators point out that the etiologic factors concerned in the damaging of the vessels and tissues are probably complex. The condition may be due, according to them, to the direct effects of cold on the one hand, and on the other to the starvation of the parts resulting from vascular constriction and the sluggishness of the circulation. There are no marked differences except in degree between the results of prolonged application of moderate wet cold and those of very low temperatures acting for a short time. To explain the predominance of damage in the feet, it is suggested that the relatively greater effect of wet cold (to which these parts are particularly exposed) as compared with dry cold is no doubt due to the fact that water is a much better conductor of heat than air; if a limb is surrounded by air, especially if the air be still, heat is only slowly lost.

It seems likely that the clinical observations of trench frostbite can now be rationally interpreted in the light of all the available experimental evidence. The swelling and redness are essentially the effects of an injury to the vessel walls which originates, when the circulation is restored, what is in essence an inflammatory reaction. The unusual resistance of the edema to pressure — a condition imitated in the experiments on animals — is evidence of the demonstrated presence of a semisolid fibrinous deposit. The varied degrees

1. Rischpler: Beitr. z. path. Anat. u. z. allg. Path., 1900, xxviii, 541.

2. Smith, J. L.; Ritchie, J., and Dawson, J.: Clinical and Experimental Observations on the Pathology of Trench Frostbite, Jour. Path. and Bacteriol., 1915, xx, 159.

of discoloration of the skin arise from the diffuse interstitial hemorrhages, and are no evidence of a true gangrene. The latter condition was, in fact, obtained in very few of the many soldiers treated by the British commission. The nature of the changes produced explains the slowness of the recovery in man; for extensive restoration of the vessel walls must occur before they can bear the strain of vasomotor changes which take place in ordinary forms of activity.

There is considerable likelihood that the pressure and constriction contributed by soldiers' boots and other footgear contribute in predisposing a part to the effects of cold. They promote the obstruction of the circulation, and when wet may cause a continuous loss of heat from a limb. The probable importance of facility for movement in preventing frostbite is illustrated by the fact that few artillerymen are reported as suffering from this condition. In the trenches it has often been practically impossible to promote the circulation in the lower limbs by voluntary movements. The individuals have been obliged at times to remain for many hours in one position with the feet immersed in mud or water.

The British commission, in considering the management of the cases when, immediately after the exposure to cold, the circulation of the limb is returning to normal, points out the need of extreme care. Application of heat in these circumstances is believed to favor the production of necrosis. Heat reacts to cause congestion in the damaged foot. The blood vessels are unable to stand the strain; the edematous swelling and hemorrhagic infiltration may be augmented. These facts will be of value even in countries in which there are no military operations; for the effects of cold in causing lesions of the extremities are not unknown in civil life, although they command less attention.

THE EARLIEST CHAPTERS IN THE HISTORY OF SURGERY AND MEDICINE

Material for the first chapters in the history of medicine is to be found in the rapidly accumulating information regarding paleolithic man. It was a startling surprise for archeologists when it was discovered that the first chapters of the history of human art were to be found among the cave dwellers, who are the earliest ancestors of European man of whom we have any record. Data which are suggestive as to the early beginnings of surgery and medicine have recently been described by Osborn,[1] who has provided illustrations as an aid to clearness. He frankly acknowledges his obligations to the men of the old stone age by setting forth on his title page "illustrations by upper paleolithic artists."

The earliest attempts at painting so far found consist of simple contours of the hand, pressed against a wall surface and outlined with color. Examples of these which have been found are also contributions to the history of surgery, for a number of these hands are partly mutilated. In some the fingers are defective, in a few all of the fingers have been amputated, though in none are any joints missing from the thumb. In nearly all the cases the fingers lack the two farther phalanges, and the stumps were evidently formed at the end of the proximal phalanx. The fact that the thumb is never mutilated has seemed to many archeologists to indicate that the mutilation must have been voluntarily performed for social or perhaps religious reasons, and the mutilation has been compared with similar practices prevailing among Australian tribes.

As most of the weapons and implements used by the cave man seem to have been held directly in the hand without the intermediary of a handle, it is easy to understand that crushing and severe injury of the fingers must have occurred during work and hunting expeditions. As a rule the thumb would be much more rarely crushed when flints or other implements were held in the hand, than would the fingers. Whether or not the cave man had learned by experience that the most useful stump could be made at the end of the proximal phalanx must be a question. Whether or not, in addition, the amputation was performed after injury or practiced as a sacrificial or religious rite, this earliest European ancestor of man must have known how to secure union of the skin surfaces above the end of the phalangeal bone. Here, then, is the illustrated record of the first surgery. The date, according to the conservative estimates of authoritative archeologists, is not later than 25,000 years before our era. It occurs in the midst of an immense amount of archeologic material, the place of which in human history has now been rather definitely traced.

The medical records of this time are much less direct. They consist mainly of figures and engravings of the cave woman. She is always represented either as pregnant, by far the most frequent mode of representation, or in association with children. Curiously enough, the distinctively female parts are always represented with considerable exaggeration. The buttocks particularly are pictured as projecting in some cases to such an extent as to be comparable with the steatopyga (fatty buttocks) of certain African tribes. The extreme of this which would represent true steatopyga occurs only once, however, and the other figures are simply corpulent. This is the most striking characteristic of all the female figures. It is all the more remarkable because none of the male figures which occur in drawing or sculpture are pictured as corpulent. On the contrary, the men's figures are lithe, muscular and athletic. Manifestly the severe exercise and continuous exertion demanded by hunting kept the man in excellent condition. His wife evidently did not do much hard work, but sat

1. Osborn, H. F.: Men of The Old Stone Age: Their Environment and Art, New York, Charles Scribner's Sons, 1915.

around the cave caring for the children and eating large quantities of fat, particularly that great delicacy of the time, the fatty marrow of the bones. Many of these bones have been found among the remains in the caves split in such a way as to facilitate the extraction of the marrow.

From these suggestions may be deduced testimony concerning the relations of husband and wife. While the father struggled to get a living, "mother," as one archeologist has suggested, "lived on the fat of the land." This is as surprising as the original discovery that the cave man was an artist. Instead of the savage we have theorized him to have been, he was eminently human and humane. The fact that what is practically obesity became a common characteristic of the women of the time shows that the tendency to put on a superabundance of flesh is not a pathologic quality which has been acquired by the race after many successive generations of overindulgence in fat-producing food, but that it existed from the very beginning whenever there was an oversupply of nutritional materials and at the same time no necessity for hard work. The tendency to a corpulent habit of body is a racial quality which manifests itself at any time when conditions favor its development.

There is a curious contribution to the psychology of the race contained in the obvious similarity between the art objects of this earliest European ancestor of man and some recent much-talked-of developments in art. Osborn calls attention to the fact that certain of the female figurines made in soapstone have all the appearances of prototypes of modern cubist art. The engravings made on bones and reindeer horn as well as on ivory are distinctly impressionistic in character. With a few lines the cave man artist suggested the appearance of a whole herd of animals, or of some huge animal like the mammoth or the bull bison in an expressive attitude. Whether the cave man is to be considered as having anticipated what is ultimate in art progress, or the cubists shall be thought to have reverted to the first art that man ever attempted, must be decided by art critics, who will doubtless line up on the two sides of these questions according to their attitude toward what is most modern in art.

It would appear impossible that a human being should develop such devotion to art without paying attention also to the arts of surgery and medicine. As yet, however, we have only the hints that have been suggested. There seems no doubt that as opportunity is provided for further investigation, an extremely interesting chapter of man's care for himself and his fellows in the midst of accident and disease may be unearthed. Some of the bones and skulls which have been discovered show signs of having undergone repair after accidents, and there seems no doubt that a fruitful vein of knowledge may here be opened.

THE OPIUM ALKALOIDS AND RESPIRATION

Few symptoms more frequently call for the intervention of the physician by the use of drugs than those involving the functions of respiration. Dyspnea and other forms of distress in breathing, as well as painful and annoying coughs, demand relief which is usually afforded in the severer cases by moderating the action of those portions of the central nervous system that regulate the respiratory processes. It is far more common in practice to be called upon to depress the activity of the respiratory center than to excite it; and the drugs par excellence which act as respiratory sedatives belong for the most part to the group of narcotics like morphin. Anesthetic or soporific substances of other types may also quiet the respiratory mechanism. They are effective in so far as they depress the entire central nervous system. The doses required are therefore relatively very large in comparison with those of the opium derivatives which seem to act more specifically on the respiratory center itself. Morphin, for example, may exhibit an unmistakable effect on breathing after the administration of doses far too small to produce the more characteristic profound general narcosis.

It is in relation to this action on the nervous system associated with respiration that part of the controversy respecting the comparative chemical value of morphin and opium has arisen. The statement is frequently made that the galenical preparations of opium are less depressant to the respiration than corresponding quantities of the isolated alkaloid morphin given alone. The dried juice of the poppy, which constitutes commercial opium, contains a series of some twenty alkaloids of which morphin is present in greatest amount. It is therefore natural to ask in what way the companions of morphin may modify its pharmacologic behavior in respect to each of the important effects which that alkaloid is known to manifest in the body. Macht[1] of the Johns Hopkins Medical School has accordingly reinvestigated the effect of opium and its derivatives on the respiration; for, as he remarks, this feature is next to its narcotic and pain-relieving action therapeutically perhaps the most important and toxicologically certainly the most striking. The subject is by no means new, nor is the mode in which a drug like the opium alkaloids may affect the respiration necessarily a simple one. It may stimulate or depress the medullary respiration center directly; it may indirectly affect respiration by modifying the metabolism and thus altering the need of receiving or discharging the respiratory gases; it may act indirectly through the circulatory changes produced in the nervous tissues; and the action may be altered by mechanical conditions which necessitate a modification of the mode of respiration so that it becomes rapid or shallow, slow or deep, or otherwise.

1. Macht, D. I.: Action of the Opium Alkaloids, Individually and in Combination with Each Other on the Respiration, Jour. Pharmacol. and Exper. Therap., 1915, vii, 339.

Hitherto most of the researches on the influence of drugs upon respiration have been complicated by the necessity of using such accessory experimental devices as anesthesia or tracheotomy or other helps to permit the essential phenomena to be properly recorded. Macht has improved the technic of his predecessors in this field by eliminating as far as possible the disturbing factors other than the drugs used. Mere inspection is, of course, not sufficient for the purpose of studying respiration; for aside from the rate of breathing it often becomes desirable to ascertain the volume of the respired air, its content of carbon dioxid and the alveolar carbon dioxid tension.

Macht has confined his attention thus far to seven opium alkaloids: morphin, codein, narcotin, papaverin, narcein, thebain and cryptopin, of which the first six are the principal constituents of opium in point of quantity. The rate of respiration is markedly slowed by morphin, an effect imitated by codein, but to a much lesser degree. Narcotin and papaverin decrease the rate only slightly; the other alkaloids do not decrease it at all, and may even increase it. These drugs may accordingly be divided into two classes. On the one hand is morphin, the prominent sedative alkaloid, which may not interfere with efficient respiration when the dose of the drug is small. In contrast with this are narcotin, papaverin, narcein, thebain and cryptopin, all of which are distinct stimulants and in large doses are excitants of the respiratory center. Codein belongs to the morphin class, though in large doses it may also excite the respiratory center.

What might be anticipated in respect to the effect of mixtures of opium alkaloids has been demonstrated experimentally by Macht. The action of combinations of them on respiration is a summation of their individual effect. While mixtures of morphin and narcotin, of morphin, narcotin, codein, papaverin, thebain and narcein (Faust's mixture), and of all the opium alkaloids (Sahli's mixture), like morphin alone, usually diminish the rate of respiration, they do not diminish the respiration volume, nor do they diminish the ventilating efficiency of respiratory movements to the same extent that morphin does. Besides they seem, in moderate doses, to leave the excitability of the respiration center almost unaffected.

It may be recalled that varied claims have been made in recent years for commercially exploited combinations of some of these opium alkaloids, particularly that they exhibit fewer objectionable effects than does morphin alone. It is therefore helpful to have careful studies like these of Macht, which were supported by a grant from the American Medical Association's Council on Pharmacy and Chemistry; for they furnish the basis alike for rational therapeutic procedure and critique of current claims.

So if the question were considered as to what results up to the present show with respect to the relative merits of these mixtures and simple alkaloids, the answer depends on what it is desired to accomplish. If the object sought is a diminution of labored activity of the respiratory muscles in a given case, it would seem that some of these mixtures, or opium itself, are to be preferred to morphin alone. If, on the other hand, it is desired to diminish the excitability of the cough reflex mechanism, it seems that the use of such mixtures would be of less advantage than the use of a simple substance like morphin or codein. For if in moderate doses the mixtures cause little or no depression of the respiration center, it may be inferred that the excitability of the cough reflex mechanism will not be reduced by them either. The suppression of the cough reflex can be effected, if at all, only by large doses containing so much morphin that the harmful cerebral depression effect would outweigh the desired effect.

Current Comment

FASHIONS IN SUICIDE

Last week THE JOURNAL noted what may be regarded as a medical curiosity — the fact that a girl had fallen from a height of over 200 feet and, alighting in a passing wagon loaded with paper boxes, sustained only slight injuries. From these she has recovered. In the same issue of THE JOURNAL, editorial attention was called to the fact that there seemed to be a fashion in methods of suicide. When any method of suicide is adopted and is noted in the newspapers, other suicides are likely to follow in which the same method is adopted. As illustrative of this fact, during the next three or four days following the occurrence of the incident reported above, the newspapers announced the deaths of two other persons who also apparently attempted suicide by leaping from tall buildings. In their cases, however, fortune did not intervene.

DIURESIS AND MILK FLOW

There are observations on record which indicate that the secretion of milk may be influenced by a contemporaneous diuresis. Precisely what changes in the composition of the milk may be initiated in this way had not been determined until recently, when the question of the influence of specific diuretics on milk flow was investigated by Steenbock[1] at the University of Wisconsin. He remarks that in view of the importance which heretofore unknown constituents of diets and rations have lately assumed, it is of the greatest interest to dissect the various factors normally operative in the body under ordinary conditions of diet. Steenbock found that urea, for example, administered in a diuretic dose, is able to decrease temporarily the flow of milk. On repeated administration, however, the increased intake of water which follows the impoverishment of the tissues with respect to water

1. Steenbock, H.: Diuresis and Milk Flow, Jour. Agric. Research, 1915, v, 561.

content balances the draft for water imposed by the diuretic, and the milk secretion comes back to normal. Other diuretic salts, like sodium chlorid, may be entirely unable to depress the milk secretion under normal circumstances, because they call forth a compensating thirst which simultaneously increases the water intake. In cases in which diuresis does lead to temporarily decreased flow of milk, the percentage of solids in the secretion is ordinarily increased, the fat being the principal variable. In ordinary experience, however, the composition of the milk may be regarded as essentially unaltered by slight variations in renal activity.

JOURNAL OF CANCER RESEARCH

Number 1 of Volume I of the *Journal of Cancer Research* has just appeared. It is edited by Dr. Richard Weil of New York, with the assistance of the Editorial Committee of the American Association for Cancer Research, Drs. Joseph C. Bloodgood, Leo Loeb, Ernest E. Tyzzer, H. Gideon Wells and William H. Woglom. In addition to six excellent articles by leaders in research, the first issue contains an abstract of the proceedings of the American Association for Cancer Research. The subject of cancer is occupying the time and labor of laboratory workers perhaps more than any other subject. The field is a large one, and certainly there is room in this country for a quarterly journal devoted to cancer.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

GEORGIA

Fraudulent Canvassers and Collectors.—See item in General News of this issue of THE JOURNAL, page 521.

Personal.—Dr. Melville C. Martin has been elected prison physician of Atlanta.——Dr. W. S. Elkin, Jr., has been elected secretary of the board of trustees of Grady Hospital, Atlanta. ——Dr. Howard J. Williams, Macon, has been reelected president, and Dr. William H. Doughty, Jr., Augusta, vice president of the state board of health.

Sanatorium News.—The annual report of the State Sanatorium, Milledgeville, shows that there has been a gain of 286 patients during the last year, bringing the total up to 4,000. More than 700 patients were admitted during the year. The building for colored patients is especially crowded. The per capita cost of feeding and clothing the inmates of the sanatorium has been reduced to 41 cents a day.——The Fulton County Public Works Committee met in Atlanta, January 13, and took up the matter of an appropriation for the extension and improvement of the Battle Hill Sanatorium for Tuberculosis, and recommended that an appropriation of $10,000 be made for this purpose.——The commissioners of Clarke County are formulating a plan to establish a tuberculosis camp for the care of worthy and needy patients, some of whom cannot be kept in sanatoriums.

IDAHO

New Officers of Medical Societies.—At the recent meeting of the Pocatello Medical Society Dr. Joseph V. Clothier was elected president; Dr. Edward N. Roberts, vice president, and Dr. F. Mertin Ray, secretary-treasurer, all of Pocatello. ——The Boise Physicians and Surgeons Club, at its annual meeting, elected Dr. James L. Stewart president; Dr. John S. Springer, vice president, and Dr. Edward E. Maxey, secretary.——At the meeting of the Southern Idaho Medical Association held in Twin Falls, January 20, the following officers were reelected: president, Dr. Joseph N. Davis, Kimberly; vice president, Dr. Corwin P. Groom, Rupert, and secretary, Dr. A. Henry Dunn, Twin Falls.

ILLINOIS

Lee County Physicians Meet.—At the annual meeting of the Lee County Medical Society held in Dixon, February 3, Dr. Nelson M. Percy, Chicago, delivered an address on "The Surgical Treatment of Pernicious Anemia," illustrated by the stereopticon. The annual election of officers resulted as follows: president, Dr. Charles C. Kost; vice president, Dr. William R. Parker, and secretary, Dr. Edmund B. Owens, all of Dixon.

Scarlet Fever.—On February 2, it was reported that the entire complement of the Great Lakes Training Station, with the exception of the hospital staff, had been removed east to avoid their exposure to scarlet fever, which broke out on the reservation, that the public had been barred from the station and that the post would not be occupied again until the release from quarantine of all the cases in the hospital. Captain Moffett states that there is no epidemic of scarlet fever at the training station and that there are only seven cases at present, with two more under observation. All the patients are isolated, and there is no danger.

Chicago

Well Known Sister Dies.—Sister Mary Dolores, for fifteen years private secretary to Dr. John B. Murphy and for many years a teacher, died suddenly, January 27, in Mercy Hospital, from heart disease, aged 57.

Third Expedition to Germany.—The American Surgeons' Expedition Committee, Inc., announces that it will send a third expedition of surgeons and nurses to Germany within a few weeks. Dr. Harry M. Richter, who is to be leader of the party, started for Germany, February 2.

Robert Koch Society.—The Robert Koch Society will hold a meeting, February 17, at the Morrison Hotel at noon. The subject for discussion will be "Tuberculosis of the Kidney." The pathology of the subject will be taken up by Dr. Dallas B. Phemister; the symptomatology by Dr. Daniel N. Eisendrath, and the diagnosis and treatment by Dr. Herman L. Kretschmer.

Municipal Health Magazine.—Health Commissioner Robertson has found a philanthropist to finance his project of a municipal health magazine for a year, at a cost of $1,000 a month. The aim of Dr. Robertson is educational and the magazine is to be given free distribution, with an issue of about 100,000 copies a month. The first issue will make its appearance in March and fourteen physicians and surgeons will be appointed as an editorial staff and advisory health board.

Personal.—Lieut.-Col. Jacob Frank, surgeon-general of Illinois, was elected president of the Army and Navy Club of Chicago at its annual meeting, February 7.——Dr. Frank S. Churchill has been elected vice president of the Infant Welfare Society and Drs. W. A. Evans, Caroline Hedger and Clifford G. Grulee were elected members of the board. ——Drs. Anna Dwyer and Effa B. Davis have been made members of a committee to draft a constitution and by-laws for a commission recently formed to study the wayward girl problem.

Historical Society Meeting.—The Society of Medical History of Chicago will meet in the walnut room of the Hotel Sherman, February 15, at 6:30, when papers will be read by Dr. Horace Manchester Brown, Milwaukee, on "Must the History of Syphilis be Rewritten? Ancient Facts and Modern Knowledge"; by Dr. A. Levinson on "A Medical Cyclopedist of the Seventeenth Century," and by Dr. Mortimer Frank, Chicago, on "The Origin of Syphilis," a paper which was read at the 1913 Congress of Medicine in London by Dr. Karl Sudhoff of Leipzig, and translated by Dr. A. Alleman, assistant librarian of the surgeon-general's office, Washington, D. C.

KENTUCKY

Prevention of Blindness.—A bill is to be introduced before the coming general assembly calling for an appropriation of about $8,000 to be used for the prevention of blindness and for the employment of a state oculist to serve jointly with the United States Public Health Service and the State Board of Health.

Interns Resign.—Nine of the twelve interns at the Louisville City Hospital tendered their resignations to the board of safety, January 27, because they objected to catheterizing male patients, a duty which has heretofore been performed by orderlies. The board of safety upheld the hospital committee in its contention and the places of the mutineers have been filled.

Personal.—Dr. Arad A. Simons, Cloverport, is ill in St. Joseph's Infirmary.——Dr. Henry P. Sights, superintendent of the Western State Hospital, Hopkinsville, for the last six years has, it is said, announced that he will not be a candidate for reappointment.——Drs. George T. Fuller, Mayfield, and Charles Z. Aud, Cecilia, have been reappointed members of the State Board of Health to succeed themselves.——Dr. Henry Enos Tuley has succeeded Sam P. Jones as president of the Iroquois Life Insurance Company. ——Dr. John F. Jessee, Waddy, was seriously injured when his automobile skidded at the foot of a long hill and crashed into an iron bridge.——The office of Dr. James B. Smith, McKinney, was burned, January 5.——Dr. Joseph F. Dusch, Louisville, was seriously injured, January 1, when he drove his automobile against a telegraph pole to avoid a collision.

MARYLAND

Fraudulent Canvassers and Collectors.—See item in General News of this issue of THE JOURNAL, page 521.

Personal.—Dr. George Y. Everhart, Hillsdale, is reported to be critically ill at his home.——Dr. J. Oliver Purvis has been elected secretary of the Anne Arundel Branch of the Maryland Society for the Prevention and Relief of Tuberculosis.

Mild Outbreak of Smallpox.—Smallpox has again broken out in Hagerstown, six cases having been reported, of which four patients are practically recovered. Dr. Caleb W. G. Rohrer, Baltimore, assistant chief of the Bureau of Communicable Diseases of the State Board of Health, has been to Hagerstown and investigated every reported case. The disease was brought to the town from Roanoke, Va.

Suit Over "Autolysin."—It is stated in New York newspapers that a suit has been entered in the Supreme Court of New York by Dr. Silas P. Beebe and Dr. A. Judson Quimby against Dr. J. Wallace Beveridge, asking that the partnership which they had formed with Dr. Beveridge for the manufacture and sale of "autolysin" be dissolved and that a receiver be appointed to take charge of the concern.

Merger Ratified.—The articles of merger between the College of Physicians and Surgeons and the University of Maryland were ratified by the regents of the university, January 5, and by this act the combination between these schools becomes a legal fact. The following members of the faculty of the College of Physicians and Surgeons were taken into the board of regents of the university: Drs. John W. Chambers, Harry Friedenwald, Archibald C. Harrison, Standish McCleary, William F. Lockwood, William S. Gardner, Cary B. Gamble, Jr., and George W. Dobbin.

Proposed Hospital for Southern Maryland.—A bill has been introduced in the General Assembly for an appropriation of $10,000 for the erection of a hospital in Charles County, to be known as the Southern Maryland Emergency Hospital. The measure calls for an additional appropriation of $3,000 a year for maintenance and provides also that the $10,000 appropriation is not to become available until the directors of the institution certify that an additional $5,000 has become available, either through private donation or by levy made by the county commissioners, or both.

MASSACHUSETTS

State Health Officers Meet.—At the annual meeting of the Massachusetts Association of Boards of Health held in Boston, January 27, the following officers were elected: president, Dr. Frank A. Woods, Holyoke; vice presidents, Drs. Francis X. Mahoney, Boston, and William W. Walcott, Natick; secretary, Dr. Francis H. Slack, Boston; and treasurer, Dr. Francis G. Curtis, Newton.

Hospital News.—Harvard University Medical School is to build a maternity hospital in the center of the present medical school group. The building will cost about $300,000.——The Infants' Hospital on VanDyke Street in the center of the Harvard medical buildings was formally opened with exercises and a reception. The speakers were Dr. Charles W. Eliot, president emeritus of Harvard University; Drs. J. Collins Warren, John Lovett Morse and Clarence J. Blake.

Medico-Military Course at Harvard.—The president and fellows of Harvard University have voted to institute a course in military medicine at Harvard Medical School. This course is to be given a trial, beginning with the second half of the academic year. Major Weston P. Chamberlain, M. C., U. S. Army, an alumnus of Harvard Medical School, has been appointed lecturer on military medicine.

Personal.—Dr. William A. Hinton has been appointed pathologist to the Boston Dispensary and placed in charge of all its laboratory work, succeeding Dr. Sarah E. Coppinger. ——Dr. James Lloyd Wellington, Swansea, the oldest alumnus of Harvard University, has celebrated his ninety-eighth birthday anniversary.——Dr. Richard C. Cabot, Boston, has been elected head of the advisory board for Massachusetts of the New England section of the National Civic Federation.—— Dr. Frank A. Woods, Holyoke, has been appointed medical examiner for the Third Hampden District, succeeding Dr. William J. Teahan, Holyoke, deceased.——Dr. George W. Dow, Lawrence, has been reappointed medical examiner and Dr. Victor A. Reed, Lawrence, associate medical examiner of Essex County.——Dr. George P. Norton, Fitchburg, has been appointed medical examiner su.ceeding Dr. Frederick H. Thompson.——Dr. Morton Prince, Boston, has returned after war service abroad.

MINNESOTA

Fire at Mayo Clinic.—Fire at the Mayo Clinic Building, Rochester, January 20, caused damage estimated at $25,000, fully covered by insurance, and the Mayo Library Building suffered minor damage by smoke.

Society Reorganized.—The Carlton County Medical Society reorganized Dec. 29, 1915, with the following officers: president, Dr. James Fleming, Cloquet; vice president, Dr. Sylvester S. Shannon, Barnum, and secretary-treasurer, Dr. Franklin W. Raiter, Cloquet.

Minnesota High in Public Health Efficiency.—Minnesota ranks fourth in the list of states in efficiency in public health work. On a basis of 1,000 points, Minnesota stood fourth with 754 points. The recommendations of the survey were that the Minnesota Health Board should retain its independence; that it should be allowed more money for extension work; that suitable laws should be passed covering water supplies and sewage disposal, and that there should be better sanitary administration in the small towns and rural districts of the state with especial reference to the spread of contagious diseases, infant mortality, poor water and unclean milk.

Reportable Diseases.—Tetanus, septic sore throat and favus have been added to the list of communicable diseases required to be reported to the State Board of Health. More strict regulations have been adopted by the State Board of Health in regard to quarantine. Milkmen are now forbidden to take anything away from a house under quarantine and must deliver milk in packages which can be destroyed as soon as used. Laundrymen must not take away bundles of laundry. In towns where there is no laboratory service, the quarantine period for diphtheria is fixed at six weeks. Proprietors of dairy farms, creameries and milk stations are required to report to local health authorities cases of communicable diseases among employees and their families.

MISSOURI

Loving Cup Given.—Dr. Charles R. Woodson, St. Joseph, president of the Missouri State Medical Association, was presented with a loving cup by members of Buchanan County Medical Society at the annual banquet held at St. Joseph, January 26.

Personal.—Dr. Owen A. Smith, Farmington, has been appointed Councilor for the Twenty-Fifth District to fill the vacancy caused by the removal from the district of Dr. Timothy T. O'Dell, Ellington.——Dr. John B. Fleet, New Franklin, is suffering from a dislocated shoulder and several fractured ribs.——Dr. Charles H. Temple, Glasgow, is in a hospital at Kansas City, suffering from an attack of paralysis.——Dr. Zebulin M. Hampton, Centralia, has been ill for some time with paralysis agitans.

St. Louis

Personal.—Dr. Franklin H. Albrecht has been appointed orthopedist at the Deaconess Hospital.——A life-size bronze tablet of Dr. Frank J. Lutz was presented to the St. Louis Medical Society by members of the society, January 29, in recognition of Dr. Lutz' services as librarian for the past

seventeen years.——Dr. Malvern B. Clopton has returned from the zone of war.——Dr. William H. Engelbach delivered an address before the Fort Madison, Iowa, Medical Society, January 20, on "Internal Secretions."

NEW MEXICO

Support for the State Board of Health.—The *New Mexico Medical Journal,* in the January number, comments on the prevalence of infectious diseases throughout the state, and on the statement of Dr. Lucien G. Rice, Albuquerque, president of the state board of health, that 500 deaths from diphtheria alone have occurred in the upper Rio Grande valley in the past three years. It is said that no doubt twice that number have occurred in the whole state, besides many deaths from scarlet fever and the other infections. That a better showing has not been made in the death rate from these diseases is said by the president of the board to be because "The law confers no jurisdiction and legislature has made no appropriations." The journal corroborates this statement, and while praising the personnel of the present board, says that the physicians of the state should get busy and see that the legislature provides a board of health in fact as well as in name, with ample funds to carry out its proper functions. It is said that the state has a sanitary board which carries out stringent regulations in regard to sheep and cattle, but that the human part of the population is not given proper consideration.

NEW YORK

New Sanatorium.—The chairman of the Chemung County Board of Supervisors has appointed a committee to take charge of the arrangements for the construction of a new tuberculosis hospital at Elmira. More than $30,000 is in hand for this purpose.

Tribute Paid to O'Connell.—At the session of the senate, January 17, an eloquent tribute to the memory of Dr. Joseph J. O'Connell, health officer of the port of New York, was paid by Senator Cullen, and at the close of his address the senate adjourned as a mark of respect.

Antityphoid Vaccination.—At Rochester it is said the health officer, Dr. George W. Goler, has issued an order that all persons connected with the dairies supplying milk to Rochester must be vaccinated against typhoid fever before the dairy licenses will be renewed. Opposition to the measures will not be regarded, as it is said by the health officer that it not only protects the persons themselves, but also protects the public.

Personal.—Dr. Louis J. Beyer has been elected president; Dr. Harold W. Cowper, vice president, and Dr. Lesser Kauffman, secretary of the staff of the Buffalo Emergency Hospital.——Dr. Magda Telkes, New York City, has been engaged to supervise the medical inspection work among women applicants at the Schenectady plant of the General Electric Company.——Dr. Henry C. Wilber, for more than thirty years health officer of Pine Plains, has retired and has been succeeded by Dr. John C. Merchant.

New York City

Pathologists Elect.—At the anniversary meeting of the New York Pathological Society, January 12, Dr. Francis C. Wood was elected president, and Dr. J. Gardner Hopkins, Brooklyn, secretary and editor of the *Proceedings.*

Clinical Meeting.—A clinical meeting of the Hospital for Deformities and Joint Diseases was held, February 8, at which papers were read on "Differential Diagnosis of Knee Joint Conditions, Description of Sayre, Frauenthal and Other Knee Splints," by Dr. Samuel A. Jahss and another on "Painful Feet, Skin Lesions, Nail Lesions, Disease of the Veins and Arteries, Disease of the Nerves, Infection of the Foot," by Dr. Harry C. Stein.

Personal.—Dr. Lysander P. Holmes has been appointed third assistant superintendent of Johns Hopkins Hospital, Baltimore.——Dr. E. Warren Presley, Greatkills, has been appointed adjunct visiting physician to the Seaside Hospital, New Dorp, Staten Island.——Dr. Mathias Figueria, consulting physician to St. Catherine's Hospital, Brooklyn, for thirty-five years, was the guest of honor at a testimonial dinner given by the staff of that institution, January 25. Dr. James C. Kennedy, Brooklyn, officiated as toastmaster.

Another Newspaper Will Decline Quack Advertisements.—A recent *Bulletin of the Department of Health* calls attention to the fact that the *Evening Telegram* has announced its intention to decline to publish advertisements of medical specialists, extends its congratulations to the *Evening Telegram* and commends its action to other newspaper proprietors. The opinion is expressed that the closure of the columns of this prominent daily will tend in a great measure to eradicate the evil of quack advertising in New York newspapers.

New Orthopedic Hospital Opened.—The new home of the New York Orthopedic Dispensary and Hospital, on East Fifty-Ninth Street, which has cost nearly one million dollars, was formally opened on January 31 with an address by Col. Theodore Roosevelt, whose father was one of the founders of the hospital fifty years ago. Dr. Russell A. Hibbs, in his address, stated that during 1915 the dispensary had treated 10,313 persons and that 630 had been treated in the hospital, and that although $1,000,000 of the $1,500,000 needed had been raised, until the remaining $500,000 was forthcoming, three of their wards must remain vacant with 150 patients waiting for beds.

Illness Census.—As a part of the intensive work being conducted in Health District No. 1, an illness census will be taken on February 19. On this day a corps of health department nurses will be detailed to call on every family living in the district and secure accurate information concerning the number, age, sex, and occupation of every member of the household, together with information concerning those who are ill, the nature of the illness and other facts pertinent to an inquiry of this kind. The information thus obtained will be tabulated and studied by the Division of Statistical Research of the Bureau of Records and will subsequently be published in the form of a bulletin.

Bacteriologic Examination of Toy Whistles.—The department of health having had its attention directed to the practice of peddlers of putting toy whistles to the mouth for purposes of demonstration, made an examination of twelve whistles purchased from push carts. Five of the whistles had metal and seven wooden mouthpieces. The average number of bacterial colonies developing from the wooden whistles was ninety-nine and from the metal whistles forty-five. A large variety of micro-organisms was found. In nine instances streptococci were isolated, two of them of the hemolyzing variety. These streptococci were tested on mice to determine their virulence. Eight of the nine mice died, five within twenty-four hours, two within the next twenty-four hours, and one four days after inoculation.

Medical Students Low in Scholarship at New York University.—With the opening of the new term at New York University, it was announced that eighty men had been dropped; of these, twenty-four were medical students. That the proportion of medical students dropped is higher than that in other departments of the university is explained by the fact that medical men in the past have been allowed to select their own subjects for entrance examinations within certain limits. It is hinted that this occurrence will result in a stiffening of the entrance requirements for the medical school. The medical department of the university is overcrowded. There are at present accommodations for only 135 new students each year, and yet 200 registered for the preparatory course last fall and 176 successfully passed their midyear examinations. Should all pass their final examinations the medical school will be unable to care for them. As a safeguard against such a contingency, a rule has been passed that hereafter no man may enter the medical school with a condition in any subject.

NORTH CAROLINA

Sanatorium Opened.—Dr. Addison G. Brenizer, Jr., opened the Brenizer Sanatorium Charlotte, January 12.

Fraudulent Canvassers and Collectors.—See item in General News of this issue of THE JOURNAL, page 521.

Vaccine for General Distribution.—The state board of health through its laboratory of hygiene, Raleigh, announced that it now has in stock, for general distribution to the profession, smallpox vaccine made by the Noguchi method in the state laboratory, Raleigh.

Precedent in County Sanitation.—New Hanover County has established what means to be altogether an innovation in county sanitation. Arrangements have been made to lend rural residents funds for the installation of water and sanitary convenience in their homes. The money is to be repaid the county on long time with 6 per cent. interest.

Children's Bureau to be Established.—Dr. J. W. McNeill, health officer of Cumberland County and Fayetteville,

announces that at the beginning of April the authorities of the United States Public Health Service will establish in that city and county a children's bureau for the study of diseases and other conditions pertaining to child life. The work will be in charge of Dr. Frances Sage Bradley, Washington, D. C., of the Children's Bureau.

Smallpox Regulations.—The commissioners of Catawba County are reported in the daily press to have passed rules "forbidding all persons who have had smallpox or who have been in contact with a case of the disease, from appearing on public highways within six weeks after such disease or contact." This, it is stated, is in order "to protect the schools of the county and prevent the further spread of the dread disorder which has been so prevalent in the county." A fine of $50 with imprisonment for thirty days is the penalty of violation of these regulations.

Personal.—Dr. James M. Northington, Boardman, was given a complimentary banquet by his associates, January 23, preparatory to his departure for Minneapolis, where he has accepted a position as teaching fellow under the Mayo Foundation in the University of Minnesota.——Dr. Robert R. Sellers, Rutherfordton, has removed to Hariman, where he will be in the medical service of the C. C. and O. Railway. ——Dr. and Mrs. Culbert N. Roberts, Lenoir, have returned from a trip to Florida and Cuba.——Dr. S. Westray Battle, Asheville, chairman of the North Carolina Belgian Relief Commission, recently returned from European battlefields and asks that contributions for this charity be sent to him at Asheville.—Dr. Ransom L. Carr, Rosehill, was operated on for appendicitis in St. Luke's Hospital, Richmond, Va., January 12, and is reported to be convalescent.——Drs. John E. Ray, Jr., Raleigh; Houston B. Hiatt, High Point, and John W. MacConnel, Davidson, have been commissioned as first lieutenants, N. C. N. G.——Dr. Cyrus Thompson, Jacksonville, has been nominated for governor by the Republican party.——Dr. Charles P. Bolles, Jr., for three years a member of the Wilmington Board of Health, has resigned.

PENNSYLVANIA

Personal.—Dr. John S. VanVoorhis is reported to be seriously ill at his home in Bellevernon.——Dr. Charles E. Heller, Williamsport, is reported to be seriously ill at his home.——Drs. John Farrell, West Chester, and Edward Kerr, East Downingtown, retiring members of the staff of the Chester County Hospital, gave a dinner at the West Chester Golf and Country Club to their associates, January 19.—— Dr. Henry Eastman, Pittsburgh, is reported to be seriously ill with pneumonia in the West Penn Hospital.

Scarlet Fever.—January 22 it was reported that scarlet fever had appeared for a second time in the University of Pennsylvania. Earlier in the month two students died from the disease. At present one student, sent home convalescent from the university hospital on account of an injury in the "Bowl" fight, became ill with scarlet fever, said by his physicians to have been contracted, probably, in the hospital. A nurse in the same ward is now confined in the Municipal Hospital on account of the disease and two other nurses who attended the student in the wards are isolated and under observation.

Philadelphia

Dr. Baker in Philadelphia.—A dinner was given by the alumni of the Women's Medical College of Pennsylvania, January 26, in honor of Dr. S. Josephine Baker, chief of the Department of Child Hygiene of New York.

Personal.—Dr. Frank C. Abbott, of the attending staff of Jefferson Hospital, has been commended by the Duchess of Bisaccia for his services in the war zone.——Drs. Seymour D. W. Ludlum, Samuel D. Ingham, Sherman F. Gilpin and Albert C. Buckley have been appointed visiting physicians to the psychopathic division of the neurologic department of the Philadelphia General Hospital.

Woman's Medical College Fellowship.—The Woman's Medical College has established a fellowship amounting to $1,000, to be awarded annually to any medical woman of special ability who, following the undergraduate course, has completed at least one year of hospital service, including work in maternity wards, and one year of further practice. The amount is to cover twelve months of special work as Fellow in Obstetrics, with the condition that the holder of the fellowship shall thereafter continue the practice of obstetrics.

A Century and a Half.—The one hundred and fiftieth anniversary of the founding of the Medical School by John Morgan at the University of Pennsylvania was celebrated by a dinner given by the Society of the Alumni of the Medical School at the Bellevue-Stratford, February 4. More than 250 physicians were present. Harvard University Medical School sent its Dean, Dr. Edward H. Bradford. Dr. John K. Mitchell was toastmaster, and speeches were made by Dr. Harry Lane, United States Senator from Oregon, Dr. Alonzo E. Taylor, provost, Edgar Fahs Smith, and Dr. Charles K. Mills.

SOUTH CAROLINA

Fraudulent Canvassers and Collectors.—See item in General News of this issue of THE JOURNAL, page 521.

Large Appropriation Recommended.—Governor Manning delivered an address before the General Assembly, January 14, in behalf of the State Hospital for the Insane and recommended that the appropriation of $320,000, asked for by the Board of Regents, be made.

Personal.—Dr. Robert Lewis, assistant biochemist at the United States Pellagra Hospital, Spartanburg, has been elected professor of physiology in the University of Colorado, Boulder.——Dr. Benjamin O. Whitten, Seneca, has been appointed a member of the house staff of the State Hospital for the Insane, Columbia.

New Hospitals.—The Steedley Hospital Company has been incorporated at Spartanburg with a capital stock of $50,000, and received its charter January 22.——Physicians and business men of Lancaster met, January 15, to discuss the need and practicability of a hospital in Lancaster. The work of formulating plans for the hospital has already been commenced.

New District Society Officers.—The twelfth semiannual meeting of the Second District Medical Association was held in St. Matthews, January 25, and Dr. Linnaeus C. Shecut, Orangeburg, was introduced into office.——The First District Medical Association held its semiannual meeting at Waterloo, January 19, and elected Dr. Lionel M. Stokes, Waterloo, president, and Dr. John B. Johnson, St. George, vice president, and reelected Dr. Joseph S. Rhame, Jr., Charleston, secretary-treasurer.

Pellagra.—On January 30, on the occasion of a visit of Dr. Joseph Goldberger and Dr. J. W. Babcock to the Epworth Orphanage at Columbia, it was found that all of the hundred children who had pellagra in September, 1915, were well. The children who had had the worst cases were found to be healthy, and all evidence of the disease had disappeared. The improvement followed the adoption in the orphanage of a better balanced ration, according to the theory of pellagra held by the officers of the Public Health Service.

TEXAS

State Society Arrangements.—Elaborate arrangements are being made by the Galveston Medical Society for the annual convention of the State Medical Society of Texas, which will be held in Galveston, May 9 to 11. Dr. Marvin L. Graves is chairman of the local committee of arrangements.

Clinical Day for County Society.—The Dallas County Medical Society held its first clinical day at Dallas, January 20. Clinics were held between 9 a. m. and 4 p. m. at the Parkland Hospital, Baptist Sanitarium, Polyclinic School and St. Paul's Sanatorium. Hereafter these clinics will be held on the third Thursday of each month.

Hospital News.—The government has made arrangements to erect a surgical pavilion at Fort Sam Houston, San Antonio.—Ground has been broken for the new Ralston Sanatorium at El Paso. The building will be four stories and basement in height and will cost about $50,000.——A free city dispensary was opened at Dallas, January 14, by the city health department in connection with the Emergency Hospital.——A movement has been started, endorsed by every physician in the city, to establish a hospital for Oak Cliff, Dallas, and a special committee of the Oak Cliff Medical and Hospital Association will present an outline of plans to the Dallas County Medical Society and later to the Chamber of Commerce and Manufacturers Association for ratification. ——Tyler and Smith counties have jointly agreed to build a small hospital in Tyler and contracts have already been let and building will begin at an early date.

Typhus.—The death of a Mexican recently from Piedras Negras of typhus in the county hospital, January 16, prompted the United States immigration officials to take stringent measures to prevent the spread of the disease. A. A. Surg. John W. Tappan, U. S. P. H. S., El Paso, the immigration medical officer, received instructions from Dr. Claude C. Pierce, senior

surgeon, to begin disinfection by gasoline and the baking of clothes of all suspects or contacts. A house-to-house canvass showed that there was no typhus in Juarez, just across the river from El Paso.——According to the *San Antonio Express*, Dr. Pierce, after an investigation of the typhus situation along the Mexican border, found only three cases at Laredo. One of these patients had died. At Brownsville and other points and in Southern Texas no cases were found, although there had been a rumor of many cases. At Monterey Dr. Pierce found only a few cases, contrary to the reports made.

VIRGINIA

Fraudulent Canvassers and Collectors.—See item in General News of this issue of The Journal, page 521.

Improvements for Epileptic Colony.—The new Halsey-Jennings Building at the State Epileptic Colony, Madison Heights, which was designed for a combined infirmary and boys' dormitory, has just been put into use and the additional accommodation relieves the congestion previously felt. There are now 340 residents in the colony.

WISCONSIN

Rhinelander Gets Laboratory.—The state board of health has decided to establish a branch hygienic laboratory at Rhinelander, for which $5,000 was appropriated by the last legislature.

Pediatrists in Milwaukee Organize.—The Milwaukee Pediatric Society was organized at a meeting held January 17, and the following officers were elected: president, Dr. Lorenzo Boorse; vice president, Dr. J. Gurney Taylor; secretary, Dr. G. J. Kaumheimer, and treasurer, Dr. Robert C. Brown.

New Hospital Dedicated.—The formal dedicatory ceremonies of the new hospital erected by the Wisconsin Deaconess Association in Green Bay were held January 18 and 19, and were participated in by officers of the Deaconess' Association, members of the Methodist clergy of the state, and others.

Cost of Smallpox.—At Manitowoc it is said bills for $3,000 have been presented to the city for caring for smallpox patients during the recent epidemic. This is in addition to the cost of supplies for quarantined families, and is in contrast with the $800 which it cost the city for free vaccination after the epidemic started.

Sanatorium News.—The Marathon County Board of Supervisors has decided to locate the county antituberculosis sanatorium on the eastern part of the county asylum farm in the town of Settin.——Willow Brook, the Kenosha Sanatorium for Tuberculosis, was opened February 1. Miss Alice Gonzenbach, formerly superintendent of the Greenfield Sanatorium, has been appointed superintendent.——The State Tuberculosis Sanatorium at Wales now has an official postoffice known as "Statesan."

New Board Officers.—At the annual meeting of the state board of health Dr. William F. Whyte, Madison, was reelected president, and Dr. Edward S. Hayes, Eau Claire, was reelected vice president. The rules governing measles, meningitis and diphtheria were amended. For measles it was proposed that in addition to placarding the house, the patient must be isolated fourteen days; children in the household who have not had measles should be secluded from school; children in the family who have not had measles can return to school fourteen days from the last exposure providing they take up their residence in other homes. The rules for meningitis and diphtheria were so changed as to arrange for the liberation of adults after thorough disinfection of persons and clothing.

Personal.—Dr. Wallace P. Smith, prison physician at Waupun, was attacked with a bottle by a convict, January 28, and sustained severe cuts and bruises of the face.——Dr. Emil S. Christensen, Two Rivers, who has been seriously ill with septicemia, is reported to be convalescent.——Drs. John Diamond, Crandon, and Raymond G. Arveson, Frederick, have formed a partnership at Frederick and will erect a hospital in the spring.——Dr. Ira F. Thompson, Rhinelander, has been made deputy state health officer in charge of District 4, with headquarters at Eau Claire.——Dr. Louis Dorpat, Oakwood, has been appointed deputy state health officer for the Rhinelander District with headquarters in that city.——Dr. Emil T. Lobedan, Milwaukee, has been elected president and Dr. Gustavus I. Hogue, Milwaukee, second vice president of the Wisconsin Association for the Blind.——Dr. Gustave C. Hoyer, Milwaukee, has been reelected medical director of the Aid Association for Lutherans.——Dr. George N. Hidershide, Arcadia, is reported to be critically ill in the Winona, Minn., General Hospital after an operation for acute appendicitis.——Dr. Glenford L. Bellis, superintendent of the Muirdale Sanatorium, Wauwatosa, has been made a member of the Committee on Standards of Diagnosis of Tuberculosis in Children.

GENERAL

American Chemist Wins Perkins Medal.—The Perkins medal for distinction in industrial chemical research has been presented by the Society of Chemical Industry to Dr. Leo H. Baekeland, a member of the Naval Consulting Board.

Photographs of Physicians.—Several letters to The Journal report that a prominent New York "picture service" corporation is asking physicians to sit for photographs to be used in The Journal. The Journal has not authorized such requests.

Federation Elects.—The following were elected officers of the Federation of State Medical Boards at its annual meeting, February 7: president, Dr. David A. Strickler, Denver; vice president, Dr. Walter P. Bowers, Boston, and secretary-treasurer, Dr. Walter L. Bierring, Des Moines (reelected).

Medical Education Meeting.—A joint conference of the Council on Medical Education, Council on Health and Public Instruction, Federation of State Medical Boards, and Association of American Medical Colleges was held in Chicago, February 7 and 8. Proceedings will be reported in a later issue.

New Quarantine Director.—A. Surg.-Gen. Leland E. Cofer, U. S. P. H. S., has been designated by Surgeon-General Blue to take over the Quarantine Station of the Port of New York. The quarantine offices are to pass temporarily from state control to the United States Public Health Service, until the New York legislature can enact legislation designed to transfer the station absolutely to federal control.

Conservation of Rural Health.—The secretary of the treasury has applied for a special appropriation of $100,000 for the field work of the United States Public Health Service. This service has for its object the wide application of methods of conserving the health of the people. These field investigations are not confined to any one section, are directed along many lines and have to do with malaria, typhoid fever, tuberculosis, trachoma and many other diseases.

Monument to Leader of Campaign Against Malaria.—Dr. William S. Thayer, Baltimore, requests contributions for the erection of a monument to Prof. Angelo Celli, Rome, the founder and the animated and guiding spirit of the foundation of the Society for the Study of Malaria, which instituted the great Italian campaign against this disease. It is contemplated that this monument will stand on the Roman Campagna, the field of the studies and the object of the most loving care of Professor Celli on the spot where he redeemed man and earth from the scourge of malaria.

Strong Joins International Corporation.—Dr. Richard P. Strong has accepted the position of vice president to the American International Corporation. This corporation recently formed with a capital of fifty million dollars is designed to procure, explore, purchase or lease, develop and operate lands and mercantile business in any part of the world. Dr. Strong will attend to the sanitation districts in which the companies development work is situated involving the construction of new sewerage and water supply systems. A number of young men will be employed to work under Dr. Strong's direction in this way.

New Officers for Medical College Association.—At the annual meeting of the Association of American Medical Colleges in Chicago, February 8, the following officers were elected: president, Dr. John L. Heffron, Syracuse, N. Y.; vice president, Dr. William S. Carter, Galveston, Texas; secretary-treasurer, Dr. Fred C. Zapffe, Chicago (reelected); and executive council, Drs. William J. Means, Columbus, Ohio; Isadore Dyer, New Orleans; Samuel W. Lambert, New York City; Charles R. Bardeen, Madison, Wis., and F. C. Waite. The association passed a resolution that, beginning with January, 1918, two years' college work will be required as an entrance qualification for the colleges of the association.

Bequests and Donations.—The following bequests and donations have recently been announced:

Episcopal Hospital and German Hospital, Philadelphia, each $1,000, by the will of the late Daniel W. Grafley.

Hahnemann Hospital, Philadelphia, $10,000, by the will of Mary L. Cooper, Narberth, Pa.

Grand View Hospital, Allentown, Pa., a donation of $12,000, by Cressman Brothers.

St. Anthony's Hospital, Oklahoma City, for the enlargement of the institution, and the installation of a medical and research laboratory, $12,000 in the first day of the campaign.

Presbyterian Hospital, Chicago, $50,000; Chicago Foundlings Home, Home for Destitute Crippled Children, Chicago Orphan Asylum and United Charities, Chicago, each $10,000, by the will of Thomas Templeton.

The Servants for the Relief of Incurable Cancer, New York City, $2,000, by the will of Kate Gilligan.

St. John's Guild, New York City, $2,000, by the will of George W. Mabie.

Fraudulent Canvassers and Collectors.—We have repeatedly published warnings against fraudulent canvassers and collectors—sometimes in the Editorial department, sometimes in Queries and Minor Notes, and sometimes in News. In spite of these repeated warnings, some of our readers are still allowing themselves to be swindled. The scheme frequently followed is one that appeals to those who are ever ready to help a fellow mortal. A young man shows a printed blank indicating that he is a "contestant" for a prize in the form of a scholarship in an educational institution, to be awarded to the one who sends in the most business in a certain time. Again we suggest that those who would avoid being swindled should not pay money to traveling men whom they do not personally know. Checks should not be made payable to any person, but to the concern the person claims to represent; and even then one should be very sure that there actually is such a concern. Money should not be paid to any one claiming to represent the American Medical Association unless he carries credentials bearing the signature of the Editor and General Manager and the seal of the Association.

Malaria.—The surgeons of the U. S. Public Health Service, in their study of malaria in the South, have found that in certain sections 4 per cent. of the inhabitants have the disease. This estimate is based on 204,881 cases reported during 1914. According to the report of the surgeon-general of this service, 13,526 blood specimens were examined during the year, of which 1,797 were positive for malaria. The infection rate among the white persons was found to be more than 8 per cent., and among the colored, 20 per cent. In the Yazoo Valley, in two counties, 40 out of 100 persons presented evidence of malaria. The surveys conducted by the service have resulted in gratifying reductions of the disease through the efforts stimulated by the survey, in thirty-four places in nearly every southern state. In some places the reduction was from 15 per cent. in 1914 to 4 or 5 per cent. in 1915. An important feature of this study of malaria was the discovery that malaria is probably not carried through the winter in the bodies of the malarial mosquito, so far as that section is concerned. Mosquitoes dissected and examined during the early spring months in 2,000 instances showed no infection, and none was discovered until May 15. The conclusion is that malaria carriers should be treated during the winter and spring with quinin so that chronic sufferers may not renew the infection in mosquitoes. Quinin is still the best means of curing the disease and preventing infection, but destruction of the breeding places of the malaria mosquito is necessary for eradicating the disease. This should be done by draining, filling, regrading of streams, oiling of breeding places, the stocking of streams with top minnows, etc.

FOREIGN

Arce Elected Fellow of London Sanitary Institute.—The *Cronica Medica* of Lima, Peru, reports that Dr. Julian Arce is the first South American to be elected fellow of the Royal Sanitary Institute of London, as recently occurred.

High Fee for German Surgeon.—It is reported from Berlin via London that an aide-de-camp of the sultan arrived in Berlin, January 30, bearing a fee of about $30,000 for Dr. Israel, who recently operated on the Turkish sovereign.

New Medical School.—According to *Commerce Reports*, the president of Venezuela has issued a decree for the establishment of a school of medicine in Caracas. A decree of the governor of the federal district provides for a free dispensary in Caracas, to be established and maintained by public funds, and to operate under the supervision of the general inspector of the civil hospitals of the district.

Vienna Institute for Study of Food Problems.—A Vienna manufacturer has given $100,000 to found an institution to study the technical side of nutrition for the people, by correlating the findings of organic chemistry, biology, physiology, etc. It is to be called the Institut für Volksernährung, and preliminary negotiations are already under way with specialists in these lines in Austria, Hungary and Germany.

Study of Criminology in Chile.—The minister of justice has appointed a commissioner to study crime in Chile and to report to the government his recommendations for measures to prevent crime, reform delinquents, and for the classification and separation of prisoners. A laboratory of experimental psychology is to be established in the penitentiary at Santiago, and physicians in penal institutions will be required to furnish information or data in connection with the work.

Professional Secrecy Need Not Extend Beyond Death.—According to a German exchange, a Berlin court recently decreed that a physician should give his testimony as to the mental soundness of a patient whose will was being contested on the grounds that the man had been mentally incapable. The physician declined to testify, but the court enjoined him to speak freely, saying that the death of his patient had released him from the obligation for professional secrecy as long as the matter was not one that concerned his former patient's good name or reputation.

Sanitation in Haiti.—Officers of the Medical Corps of the Navy attached to the Marine Brigade now on duty in Haiti are making a careful sanitary survey of Port au Prince, and have made certain specific recommendations as a result of which the water supply is more effectively guarded; the markets and sources of food supply are more rigorously inspected and controlled and the removal of refuse in the city streets, cleaning, grading and guttering, is actively being carried on. The island of Santo Domingo has been notably unhealthy during its entire history, but owing to the rigid sanitary methods imposed under the direction of the naval medical officers, the reports from the marines' camps from the north and south coasts of the island and the interior indicate a low sick rate.

Deaths in the Profession Abroad.—Tiburcio Padilla, one of the leaders of the profession in Argentina, ex-governor of his province, Tucuman, aged 80.——P. Beyers of Breda, a member of the Netherlands ambulance sent to Serbia, cooperating with the Austrian ambulance.——R. Heigl, chief of the public hospital at Coblenz, succumbed to infection acquired at an operation, aged 54.——F. L. von Neugebauer of Warsaw, noted for his numerous articles on gynecologic subjects but especially for his study and publications on hermaphroditism and allied conditions.——L. R. Lorentzen of Copenhagen, president for a number of terms of the Danish Medical Association, aged 63. He took up surgery at first but a bile-duct trouble soon after 40, causing the expulsion of the gallbladder, compelled him to give up surgical work. ——M. De Cristoforis, to whose efforts is due in large part the leading place taken by Milan in public hygiene, in prophylaxis of industrial affections and other reforms, aged 80. As a senator it was said of him that he had many opponents but not a single enemy. He introduced the treatment of aneurysm by electropuncture, although gynecology and obstetrics were his chosen field.——T. Langhans, until recently professor of pathologic anatomy at the University of Bern, aged 76. He was a pioneer in the discovery of the giant cell, in the histology of the placenta and of nephritis, and also in the study of endemic goiter.——A. Mendonça, chief of the bacteriologic institute connected with the medical school at S. Paulo, Brazil, of the leprosarium and men's clinic, and founder of the *Revista Medica de S. Paulo*. ——Sir Francis Henry Lovell, dean of the London School of Tropical Medicine, died in London, January 28. Sir Francis became M.R.C.S., England in 1865, and two years later L.S.A. He entered the colonial service as surgeon in Sierra Leone, West Africa, in 1873; in 1878 he was made chief medical officer and president of the General Board of Health and a member of the legislative council of Mauritius. After fifteen years in this service he was transferred as surgeon-general, medical officer of health and member of the executive and legislative councils of Trinidad and Tobago, and served in these capacities until 1901, when

he retired from the colonial service. A year prior to his retirement he was made a baronet, and in 1893 was created C.M.G. After his retirement he was connected with the London School of Tropical Medicine, Royal Albert Docks, and was dean of that institution until his death.

WAR NOTES

Typhus in Poland.—It is reported from Berlin via London, under date of February 3, that typhus fever has broken out in Poland and that there are now thirty cases daily in Warsaw. The death rate has risen from nineteen to thirty per 1,000.

Change of Post for Pancoast.—Dr. Charles S. Pancoast, Camden, N. J., who has been in charge of a 4,000-bed hospital at Munkacs, Hungary, has been accepted by the Bulgarian war department and placed in charge of the surgical department of a large war hospital in Sofia.

The Quirinal a Red Cross Hospital.—The Quirinal Palace in Rome has been transformed into a Red Cross hospital under the personal supervision of Queen Elena, who takes active charge of the institution. The gun room of the late King Humbert is now a dispensary, and the conservatory an operating room.

Lack of Physicians Raises Mortality.—A complaint is being made that a large district in France is entirely without physicians due to the exigencies of war. In the neighborhood of Lyons the sick of fourteen towns and villages are under the care of one old practitioner who retired fifteen years ago. Formerly this district had five physicians, but all of them are now in the field. In other districts the same condition obtains, and the result is said to be an alarming increase in mortality, especially among children.

PARIS LETTER

Paris, Jan. 13, 1916.

The War

SPECIAL ADVANCEMENT OF QUALIFIED PHYSICIANS AND PHARMACISTS

The new minister of war, General Galliéni, believes that under present conditions it is indispensable to utilize especially well qualified physicians and pharmacists in the army as efficaciously as possible. He has therefore decided to give a military grade corresponding to their scientific rank for the duration of the war, to pharmacists and physicians possessed of certain university or hospital positions. Accordingly, a decree has just been signed by the president of the republic for the immediate promotion from the grade of *aide major de 2-e classe* (second lieutenant) to the grade of *major de 1-ere classe* (commandant) or *major de 2-e classe* (captain), according to the length of their experience, of physicians and pharmacists possessed of the following qualifications: professorship or agrégé professorship in the medical or pharmaceutical schools or membership in a hospital staff in cities where medical schools are situated.

The *Journal des Débats* remarks that this decree meets perfectly the needs of the situation; it is a conspicuous and deplorable anomaly which puts scientific men of high reputation under the orders of less qualified practitioners who, because they possess a higher military rank, wield responsibilities sometimes in excess of their abilities.

PLACING OF SICK PRISONERS OF WAR IN SWISS HOSPITALS

According to Swiss journals, the negotiations for placing sick prisoners of war in Swiss hospitals (The Journal, Oct. 2, 1915, p. 1199) are making progress. The problem was recently discussed at a meeting of heads of sanatoriums and pensions. It is probable that the first trial will be made with about one thousand French prisoners and about as many German prisoners. The former will be placed in hospitals at Leysin and the latter at Davos. Of course, this measure will be applied only in cases of patients whose condition is not serious since, as I mentioned in previous letters, prisoners who are seriously affected will be exchanged by the respective belligerent countries.

THE VALUE OF ANTISEPTICS IN THE TREATMENT OF WOUNDS

At a recent session of the Académie des sciences, Dr. Pierre Delbet reported a new series of experiments on the action of antiseptics on pus. Pus immersed in twice its volume of antiseptic solution for seven hours is seldom sterilized. In 2 per cent. phenol solution the pus was sterilized in six cases out of fifteen; in ether, in two cases out of eight; in corrosive sublimate, in two cases out of nine; in hydrogen peroxid, in one case out of six; in Dakin's solution, in two cases out of twelve; in Labarraque's solution sterilization was not obtained once in thirteen trials. A hematic pus diluted with twice its volume of Dakin's solution gave cultures of staphylococci and streptococci after thirteen days. Examinations of the preparations made with the pus employed in these experiments showed that while some of the microbes had been destroyed others had multiplied extraordinarily. Delbet believes that this is due to the chemical transformations of the pus and the formation, under the influence of hypochlorites, of intermediary substances favorable to the germs. He illustrates this by the fact that, while eggs furnish a mediocre culture medium for the staphylococcus and a poor one for the streptococcus, on the addition of Dakin's solution, one third, one half or two thirds volume, the egg becomes a good culture medium for the staphylococcus and an excellent one for the streptococcus. In attempting to kill germs with hypochlorites one runs the risk of preparing a culture medium for them. The production of such intermediary substances (culture mediums), together with the suppression of phagocytosis by the destruction of cells, accounts for the fact that in certain cases antiseptic dressings interfere with the healing of wounds, increase the number of germs and are altogether more harmful than useful.

HOME MECHANICAL TREATMENT FOR ARTICULAR STIFFNESS

The frequency of articular stiffness after wounds of war is well known. The treatment is not always easy, for institutions where mechanical treatment can be applied are not numerous and cannot be multiplied rapidly. The following very simple device invented by Dr. Privat, which gives excellent results, is therefore worthy of mention: Continuous traction is exerted on the limb to be mobilized perpendicularly to its axis by means of a weight hung from a cord passing over a pulley which is not fixed but hung by a cord from the ceiling. When the weight swings it produces gentle and rhythmic traction passing from maximum to minimum and vice versa. By pulling a cord attached to the weight and letting it slip again, the patient controls the oscillations. The operations of the device may be graduated by employing pulleys of various diameters for the same motor weight (5 kilograms, for instance).

THE FRENCH MEDICAL MISSION IN SERBIA

The *Journal Officiel* publishes the award of the epidemic gold medal to Dr. Jaubert, head of the French medical mission in Serbia. Dr. Jaubert also has been mentioned for conspicuous gallantry in the following terms: "Head of the French medical mission sent into Serbia, he displayed the finest abnegation and the greatest courage, giving to all the example of devotion to duty and, by the conscientiousness with which he performed his task, reflecting the greatest honor on France."

A Pharmaceutical Fraud

Aspirin, which ordinarily is supplied to France from abroad by way of Marseilles, is at present worth 200 francs a kilo (nearly $16 a pound). Some pharmacists and druggists of Paris have been supplied recently with a worthless substitute powder containing no acetylsalicylic acid. The service for the repression of frauds in the police department is now endeavoring to ascertain if the fraud was committed abroad or if the substitution was made in Marseilles. Meanwhile a circular is being sent to all French pharmacists and druggists warning against the fraud.

Digestive Power of Oysters

M. Henri Coupin has presented before the Académie des sciences a notation showing that the digestive power attributed to oysters belongs, not to the oysters themselves, but to the bacteria ingested with the water that bathes them. Coupin found great chemical activity on the part of most marine bacteria. Out of forty-three species only four were inert. Twenty-eight produced fermentation in glucose, twenty-one in maltose, eleven in starch and ten in glycogen.

Death of Prof. Rodolphe Engel

Dr. Rodolphe Engel, former professor of chemistry at the Faculté de médecine de Montpellier, has just died at the age of 66. He was the author of many scientific works and of a manual, "New Elements of Medical and Biologic Chemistry with Applications to Hygiene, Legal Medicine and Pharmacy."

BERLIN LETTER

BERLIN, Dec. 27, 1915.

The War

MORTALITY OF THE WOUNDED

The number of wounded who have been returned to duty has increased steadily from month to month, and the mortality among them has been correspondingly diminished. In August, 1914, of 100 wounded, 84.8 per cent. returned to duty, 3.0 died, and 12.2 were permanently invalided. In September, 1914, 88.1 per cent. were returned to duty, and only 2.7 per cent. died. In October, 1914, 88.9 per cent. were returned to duty, and the mortality was 2.4 per cent. From November to March the percentages of those returned to duty varied between 87.3 and 88.9. The death rate in November was 2.1. In December, 1914, the death rate was only 1.7 per cent. In January, 1915, it was 1.4 per cent., and in February, 1.3 per cent. During April and May the mortality rate rose to 1.4 per cent., but gradually fell to 1.2 per cent. during June and July. In April, 91.2 per cent. were returned to duty; in June, 91.7 per cent.; in May and July, 91.8 per cent. Only 7 per cent. were permanently invalided or given furloughs. Of the latter, a considerable number subsequently returned to duty, thus increasing the percentage of that class. The total averages show that per hundred men, 98.8 per cent. were returned to duty or were only partially unfit, whereas only 1.2 per cent. died. The averages for the entire year were 89.5 returned to duty, 8.8 unfit or on furlough, mortality, 1.7 per cent.

CARE OF WOUNDED

The Swiss government has proposed that 1,000 sick German and French prisoners of war be sent to Switzerland, January 15, for medical care. The German government has accepted the proposal, with the proviso that the French government will cooperate in delivering an equal number of prisoners at the same time.

According to the *Sydsvenska Dagbladet*, the large transports of Russo-German war invalids have been discontinued for the year. Up to the present, 4,603 German and Austrian and 7,730 Russian invalids have been convoyed.

At the request of the Berlin Aerztekammer-Komission (medical commission), the head of the police department has ordered the removal from public comfort stations of all advertising matter relating to the treatment of venereal diseases. This is one step in the fight against quackery that is being made by the Berlin Medical Society.

THE GERMAN STUDENTS DURING THE WAR

During the semester preceding the opening of the war, 79,077 students (of whom 4,500 were women and about 9,000 foreigners) attended the fifty-two universities and other higher institutions of the German Empire. Of this number 60,943 (4,117 women, 4,100 foreigners) were enrolled in the twenty-one universities; 12,232 (82 women, 2,500 foreigners) were enrolled in the eleven technical schools. The six schools of commerce (Berlin, Cologne, Frankfort, Leipzig, Mannheim and Munich) had 2,625 students, and the four veterinary colleges (Berlin, Dresden, Hanover and Munich) had 1,404 students. The three agricultural colleges had 938 students. Three schools of mining had 668 students, and 267 students were registered in the four schools of forestry. During the first semester following the beginning of the war, the total number of matriculants fell to 64,700 in forty-seven of these institutions. The four schools of forestry were closed, and the veterinary school in Munich became a part of the university. Of this number 52,400 were registered in the universities, 9,900 in the technical schools, 350 in the veterinary and agricultural schools, 400 in the mining schools and 1,200 in the schools of commerce. The number of foreign students fell to 4,000, and only 4,500 women students were in attendance. These figures may not be correct, inasmuch as reliable data are available only from the universities and technical schools. During the winter of 1914-15, about 50,000 of these students were in the field or available for service; that is, 75.75 per cent. of the 66,000 German male students registered at the beginning of the war. It can be assumed that the remaining 25 per cent. of students stood in some relationship to the military system, excluding probably only the agriculturists and the commerce students, of whom a very small number are now engaged in practical work. Of the 66,000 German male students who were registered at the end of the summer of 1915, only 12,000 are still in attendance at the schools, so that about 54,000, or 81.81 per cent., of German higher students are now enrolled in the army. It is interesting, by way of contrast, that of the 13,785 university students registered during the summer semester of 1870, only 4,400 (32 per cent.) were at the front, and 3,200 of this number fell in the field.

Personal

Dr. Alzheimer, professor of psychiatry in the Breslau university, died, December 19, aged 52 years. In 1888 he was appointed assistant at the Frankfort psychopathic institute, and became chief in 1895. In 1902 he became assistant to Kräpelin in Heidelberg, and when the latter was called to Munich to take the directorship of the anatomic research department of the new clinic, Alzheimer went with him. In 1913 he was called to Breslau, but soon after arriving there he became seriously ill, never recovering completely, and finally succumbing to the illness. He was an indefatigable worker in psychiatric research. He made many original observations and studies of the pathologic lesions of psychiatric diseases. His differentiations were so accurate, especially in paralyses of various kinds, that the pathology of these conditions is now well known and easily distinguished from other similar disease processes. He collaborated extensively with Professor Nissl of Heidelberg in histologic research, laying bare the finest anatomic variations in structure of paralysis, epilepsy, idiocy, arteriosclerosis, senescence and cerebral syphilis. This research led him to announce that it was the function of the glia tissue to dispose of the tissue waste. He also studied extensively and gave a most thorough and exhaustive description of a hitherto unknown mental disease of occasional occurrence in old age, since known as Alzheimer's disease. In 1910, Alzheimer and Lewandowsky established the *Zeitschrift für die gesamte Neurologie und Psychiatrie*, contributing the initial article on the diagnostic difficulties in psychiatry, in which he also detailed his clinical experiences.

Decrease in Mortality in Berlin, and Diminishing Birth Rate in the German Empire During the War

Although the war has exerted a tremendous influence on population statistics because of the fewer marriages and births, Berlin reports show a considerable lowering of the death rate in general and of children in particular. These data are set forth in detail in the monthly report of the statistics division of Berlin for September 1915. The general death rate during September, 1915, was 12.84, as against 14.36 for the same month in 1914. These figures must be a source of congratulation when one bears in mind that the stronger and healthier portion of the male population is at the front, leaving the weaker members at home. Children's mortality has been diminished one half. In September, 1915, 262 children under 1 year of age died in Berlin, as against 644 in September, 1914, that is, 13.48 per cent. as against 27.51 per cent. of the total death rate of the city for that month. The principal causes of death among these children (exclusive of general weakness) were intestinal catarrh and diarrhea. Only fifty-three children under 1 year of age died from intestinal catarrh during September, 1915, as against 217 in September, 1914; the proportion for diarrhea was 17:112. These figures are an indication of the effective campaign against children's mortality which has not diminished during the war; on the contrary, it has been conducted more effectively. The birth rate has not diminished so very much; in September, 1915, 2,303 living children were born in Berlin, as against 2,996 in September, 1914. For the year the birth rate per thousand was 15.21 per cent., as against 18.37 per cent. The birth rate has not fallen off so much during the war as is generally believed to be the case. On the basis of 100 born during the months of April, May, June and July, 1914, the birth rate for the same period of 1915 was as follows: Cologne, 94.2; Kiel, 87.9; Schöneberg, 85.5; Leipzig, 84.1; Dortmund, 83.8; Munich, 81.2; Berlin, 80.2; Hamburg, 76.2; Frankfort-on-the-Main, 73.5; New Cologne, 72.2; Nuremberg, 68.8; Essen, 120.2. As stated previously, the figures for Essen are deceptive because of the increase in population. The falling off of the birth rate as a whole, then, is not over 20 per cent.

Care of the War Cripples

What might be called a lost limb bureau *(Gliederersatzprüfstelle)* has been established in Charlottenburg for the purpose of supplying lost body members and determining the line of work for which the individual may be fitted when artificial arms and legs have been supplied him. Soldiers coming from the various hospitals will be sent to this bureau, and it is expected that in the course of time a school will be established or founded or developed in which these individuals will be taught how to carry on different lines of work. This bureau will publish reports showing the progress that has been made in the development of these men, and how

artificial limbs may be improved in manufacture to permit of greater use. The various manufacturing industries throughout Germany will receive these publications. These men will be trained as metal workers, wood workers, transport laborers, to work with the hoe, the broom, the cart, textile workers and agriculturists.

Insurance Companies War on Venereal Diseases

The presidents of the various German insurance companies met, January 14, in the imperial insurance bureau with representatives of the health department and the Prussian army medical corps, for the purpose of considering further measures in the fight against venereal diseases. The military authorities commended the measures proposed by the insurance companies by which the patient receives thorough treatment without any publicity, and urged that when such patients are dismissed from the military service they be given this treatment. This action also received the approval of the army and navy authorities, the German medical profession, and the sick benefit and workmen's associations. Insurance companies intend to establish consultation and treatment bureaus at which all discharged soldiers may apply, and these measures will later be extended and made available to all workmen who are members of the workmen's insurance societies. It was the sense of this meeting that these measures should receive hearty support. As a result of all this activity, a motion was passed forbidding the increase in quackery during the war.

LONDON LETTER

London, Jan. 20, 1916.

The War

THE MEDICAL EXAMINATION OF RECRUITS

The examination of the large numbers of recruits which have flocked to join the new armies has presented considerable difficulty. Many physicians have had to abandon temporarily their private work and examine men from morning till late at night. In numerous cases the work was necessarily done perfunctorily, men being examined at the rate of one every two minutes. Like everything else in connection with our new military organization, improved methods are gradually being introduced. Sir Alfred Keogh, director general of the Army Medical Service Corps, has now arranged that special stations for the examination of recruits are to be set up, each of which shall be under the control of a body of men specially chosen and approved. This council will select the examining physicians and will be guided in its work by special considerations. Physicians will be chosen because they have special qualifications for examining men for the army. An officer of the Royal Army Medical Corps will be attached to each station. The question of the number of recruits to be examined at each station per day has been seriously considered, and it has been laid down that not more than 200 men shall be examined at any one station in any one day. This, with the staff of physicians at hand, will make it absolutely certain that each recruit will have full justice done to him. Each recruit will be carefully examined in a quiet room and under the most favorable conditions, and each man will be summed up by the physician examining him and classified according to his capacity. Thus one man will be certified fit for general service, another as fit for less active work, and so on. These classifications will be handed on to the military authorities, and dealt with by them according to military requirements. No man will be sent to work for which he is unfit, nor will any man be put to drilling which his constitution or present state of strength does not sanction. "Doubtfuls," that is, men whose state of health may be such as to call for an expert opinion, will be sent to specialists.

TRAINING BELGIAN PHARMACISTS IN ENGLISH METHODS

The Pharmaceutical Society of Great Britain arranged a class for training the Belgian pharmacists in this country in English methods of dispensing, and in the reading and translation of English prescriptions. The class, which was entirely gratuitous, was held during the Christmas holidays. Prof. H. J. Greenish taught practical dispensing, and Mr. H. S. Phillips the reading of prescriptions.

Sir William Osler on the Education of Boys Intended for the Medical Profession

A conference of educational associations has been held at the University of London at which Sir William Osler pleaded that boys intended for the medical profession should leave the hands of the schoolmaster fit to begin their special studies. He urged that earlier and more extensive work in science would save time at the universities. He thought that by the time a boy was 16 he had in most cases selected his career, and that when he intended to enter the medical profession, the sixteenth and seventeenth years should be devoted to the preliminary sciences—physics, chemistry and biology. At 18 the boy would be fit to go to the university and to proceed at once with physiologic chemistry, physiology and anatomy. He contended, therefore, that a continuous science course should be organized for two years. The teaching of chemistry at the schools was not yet good enough. If it were improved and the other preliminary sciences well taught, he believed that by shortening the vacation and rearranging the methods of instruction it would be possible to return to a four year curriculum for medical students. The average man would then qualify at 22, spend a year in hospital or in graduate study and start life at 23. Sir William considered that under our present system, valuable time was being lost because science was a Cinderella in the kitchen instead of a dominant partner in the educational family. His views as to the shortening of the curriculum are not in agreement with the report made by the Education Committee of the General Medical Council made nine years ago. An investigation showed that the mean length of the curriculum was about seven years—in England seven and one-half, and in Scotland and Ireland a little over six and one-half years. The possible minimum time is five years, and teachers complain that this is not sufficient for all the subjects which a student ought to learn.

Government Medical Work in India

The extent of the government medical work in India is shown by the recently issued report of the surgeon-general. At the regular dispensaries of Bengal (which is only one of three provinces of India) 5,571,000 patients were treated—an increase of 380,000 over the previous year. In addition, 130,000 were treated at certain mission and temporary epidemic dispensaries, and at fairs visited by medical officers. It is evident that the people appreciate more and more the benefits to be derived from these institutions. In the hospitals there are great difficulties as to nursing, but the training of Indian women as nurses has been started at some centers of Bengal.

New Medical College at Bombay

Owing to the munificent donation of Mr. Gordhandass Sunderdass, a want long felt in Bombay—a second medical college—will be established in connection with the King Edward Hospital and affiliated to the Bombay University. A condition of the donation is that the professors and teachers shall all be qualified Indian gentlemen not in government employ.

Deaths from Wild Animals in India

The government report shows that during the past year, 1,745 persons were killed by wild animals, an increase of about 9 per cent. over the previous year. Tigers were responsible for 646. In one district a man-eater killed 289 persons. The number of lives lost by snake-bite amounted to 22,894, an increase of 1,124 over the previous year's figures. The number of cattle killed by wild animals was 94,746. The number of snakes destroyed was 118,816.

Marriages

Marinda E. Blackburn, M.D., Columbus, Ohio, to Mr. P. M. Weddell of San Jose, Calif., at Los Angeles, December 27.

Edward August Hoefer, M.D., Grafton, Iowa, to Miss Goldie Cleveland White of Greenville, Miss., January 16.

Evarts Ambrose Graham, M.D., Mason City, Iowa, to Miss Helen Tredway of Dubuque, Iowa, January 29.

Earl Fuller Shaw, M.D., Williamston, Mich., to Mrs. Lyda E. Grant of Lansing, Mich., January 27.

Joseph A. S. Regli, M.D., San Jose, Calif., to Miss Anna Rebecca Kelly of Oakland, Calif., January 19.

Marion Helena Ober, M.D., Eugene, Ore., to Mr. George M. Locke of Portland, Ore., January 22.

James Brooks Vaughan, M.D., to Miss Eula Belle Simpson of Williamsburg, Mo., January 27.

Thomas Benton Sellers, M.D., to Miss Kate Terry, both of New Orleans, December 23.

Deaths

Richard Channing Moore, M.D. Northwestern University Medical School, Chicago, 1865; aged 74; a Fellow of the American Medical Association, and second vice president in 1890-91; president of the Nebraska State Medical Society in 1887; of the Omaha Medical Society in 1898, and of the Medical Society of the Missouri Valley in 1901; acting assistant surgeon, U. S. Army, in 1864 with Civil War service; city physician of Omaha in 1876; one of the founders of the first medical college in the city which developed into the University of Nebraska College of Medicine and professor of diseases of the mind in that institution; was given a loving cup in January, 1910, by the Omaha-Douglas County Medical Society, of which he was a charter member; died at his home in Omaha, January 27.

James Burgess Book, M.D. Jefferson Medical College, 1865; aged 72; a Fellow of the American Medical Association; for many years professor of surgery in the Detroit College of Medicine and Surgery; prominent as a surgeon and business man of Detroit; formerly a member of the staff of St. Luke's and Harper hospitals; surgeon of the Independent Military Battalion, Detroit, in 1881 and later a member of the medical staff of the Fourth Infantry, Mich. N. G.; for one term a member of the city council and for the last twenty-five years a director in prominent financial institutions of the city; died at his home in Detroit, January 31, from septic pneumonia.

John M. Kitchen, M.D. New York University, New York City, 1846; aged 89; an honorary member of the Indiana State Medical Association; surgeon in charge of the U. S. Army Hospital, Indianapolis, from 1861 to 1865; consulting physician to the State Institution for the Deaf from 1872 to 1877; physician to the State Institution for the Blind; consulting physician to the Indianapolis City Hospital; one of the founders of the Indianapolis Medical Society and formerly president of the Marion County Medical Society and president of the board of trustees of the Medical College of Indiana; one of the oldest practitioners of Indianapolis and for many years prominently identified with medical activities in that city; died in his apartment in Indianapolis, February 5.

Jesse B. Burditt, M.D. Tulane University, New Orleans, 1894; aged 44; a member of the State Medical Association of Texas and a specialist on diseases of the eye, ear, nose and throat; a member of the medical staff of the Baptist Sanitarium and of the Southern Pacific Hospital, Houston, Texas; for the last six years a practitioner of Houston; was found dead in the bathroom in his apartment in that city, January 24, from heart disease.

Roscoe G. Dixon, M.D. Memphis Hospital Medical College, Memphis, Tenn., 1910; aged 31; formerly a Fellow of the American Medical Association; a member of the Oklahoma State Medical Association; of Sugden, Okla.; while crossing the Rock Island tracks in his automobile, January 23, was struck by a train and sustained injuries from which he died a few hours later. Mrs. Dixon, who was with him, was killed instantly.

Eugene Miller Smyser, M.D. University of Pennsylvania, Philadelphia, 1864; aged 73; a practitioner and druggist of Kings Park, N. Y.; assistant surgeon of the Thirty-Fourth Pennsylvania Militia during an existing emergency from June 3 to Aug. 24, 1863, and assistant surgeon of the Forty-Eighth Pennsylvania Volunteer Infantry from April, 1864, until the close of the Civil War; died at his home in Brooklyn, January 27.

Samuel M. Miller, M.D. Kentucky School of Medicine, Louisville, 1876; aged 64; a Fellow of the American Medical Association; professor of gynecology in the Medical Department of Lincoln Memorial University, Knoxville, Tenn.; formerly president of the East Tennessee and Knox County medical societies and a member of the Southern Association of Railway Surgeons; died at his home in Knoxville, January 28.

Edward McCord Scott, M.D. Vanderbilt University, Nashville, Tenn., 1900; aged 39; a Fellow of the American Medical Association and formerly secretary of the Ashley County (Ark.) Medical Society; a prominent practitioner of Hamburg, Ark.; who was operated on at St. Luke's Hospital, Little Rock, Ark., a week before for appendicitis, died in that institution, January 21, from embolism.

George Howard Malcolm Rowe, M.D. Harvard Medical School, 1868; aged 74; a Fellow of the American Medical Association; a member of the American Public Health Association and president of the American Association of Hospital Superintendents; who resigned as superintendent of the Boston City Hospital in 1908 after thirty years' service; died at his home in Boston, January 30.

Edward Smith Eveleth, M.D. College of Physicians and Surgeons in the City of New York, 1866; aged 74; a member of the Massachusetts Medical Society and a member of the staff of the Addison Gilbert Hospital, Gloucester, Mass.; one of the oldest practitioners of Gloucester; for many years a member of the local school board; died at his home in East Gloucester, January 25.

Conrad S. Reynolds, M.D. University of Pennsylvania, Philadelphia, 1883; aged 57; a Fellow of the American Medical Association and for thirty years a practitioner of Kennett Square; for many years a member of the Borough Board of Health and Borough Hospital; died in the German Hospital, Philadelphia, January 21, a day after an operation for appendicitis.

Thomas P. Singletary, M.D. Louisville (Ky.) Medical College, 1887; aged 55; a member of the Louisiana State Medical Association; coroner of East Baton Rouge County for four terms; local surgeon at Baton Rouge for the railways centering in that city and founder of the Baton Rouge Sanitarium; died at his home in Baton Rouge, January 23.

Robert Manton Wilson, M.D. Missouri Medical College, St. Louis, 1879; Jefferson School of Medicine, Louisville, 1882; aged 59; local surgeon at Hope, Ark., for the St. Louis, Iron Mountain and Southern, and Arkansas and Louisiana railways; a member of the International Association of Railway Surgeons; died at his home in Hope, January 26.

Asa Jacob Weaver, M.D. Northwestern Medical College, St. Joseph, Mo., 1893; aged 47; a Fellow of the American Medical Association; coroner of Cloud County, Kan.; a well-known surgeon of Concordia and proprietor of the Weaver Hospital in that city; died at his home in Concordia, January 27, from cerebral hemorrhage.

Frederick Lawford, M.D. University of Maryland, Baltimore, 1900; aged 40; a member of the Medical Society of Virginia; surgeon to the Norfolk and Southern Railway and Berkley Street Railway; proprietor of the Lawford Hotel and Hospital, Berkley, Norfolk, Va.; died at his home in Norfolk, January 24, from pneumonia.

John Mullin Batten, M.D. University of Pennsylvania, Philadelphia, 1864; aged 78; a Fellow of the American Medical Association; surgeon in the United States Navy from 1864 to 1866 with Civil War service; for many years a practitioner of Pittsburgh; died at his home in Downington, Pa., January 23.

Joseph Levan-Van Bender, M.D. Eclectic Medical College of the City of New York, 1882; aged 75; formerly a member of the Medical Society of the State of New York; a veteran of the Civil War; for more than forty years a practitioner of Penn Yan, N. Y.; died at his home in that city, January 21.

William Francis Jones, M.D. University of Pennsylvania, Philadelphia, 1874; aged 71; a member of the Medical Society of Virginia; a Confederate veteran; for more than a quarter of a century a practitioner of Gloucester County, Va.; died at his home in Gloucester, Va., January 24.

Lois Fitch Mansfield, M.D. Northwestern University Women's Medical School, Chicago, 1876; aged 86; for thirty years a practitioner of Santa Barbara, Calif.; who is said to have conducted the first open-air school in America; died at her home in Santa Barbara, about January 29.

Robert H. McKee, M.D. Medical College of Ohio, Cincinnati, 1870; aged 71; formerly a member of the Ohio State Medical Association; health officer of Bainbridge, Ohio; a veteran of the Civil War; died at his home in Bainbridge, January 24, from cerebral hemorrhage.

Henry J. Sharp, M.D. Starling Medical College, Columbus, Ohio, 1871; aged 69; formerly a member of the Ohio State Medical Association; a veteran of the Civil War; for forty-five years a resident of London, Ohio; died at his home in that place, January 19.

Daniel A. Bissell, M.D. Hahnemann Medical College, Chicago, 1883; aged 62; health officer of Afton, N. Y., from 1886 to 1889 and for many years a practitioner of Gloversville; died at the home of his daughter in Yonkers, N. Y., January 29, from heart disease.

Thomas Benton Swartz, M.D. Northwestern University Medical School, 1888; aged 60; a Fellow of the American Medical Association; was stricken with cerebral hemorrhage, January 28, while making a professional call, and died at his home in Chicago, February 1.

James S. Edwards, M.D. McGill University, Montreal, 1880; aged 59; a Fellow of the American Medical Association, and one of the most esteemed general practitioners of Grand Rapids, Mich.; died at his home in that city, January 23, from pneumonia.

Carl Ultes, M.D. University of Michigan, Ann Arbor, 1875; Bellevue Hospital Medical College, 1878; aged 67; a member of the Ohio State Medical Association and for many years a practitioner of Springfield, Ohio; died in Eustis, Fla., January 28.

James B. Duncan, M.D. Kentucky School of Medicine, Louisville, 1879; aged 59; a Fellow of the American Medical Association and a well-known practitioner of Southern Indiana; died at his home in Bedford, Ind., January 31, from pneumonia.

John W. Cates, M.D. University of Nashville, Tenn., 1856; aged 84; a surgeon in the Confederate service throughout the Civil War and since its close a practitioner of Maryville, Tenn.; died at his home in that place, January 21, from heart disease.

Peter Jerome Curren, M.D. Long Island College Hospital, Brooklyn, 1882; aged 62; for several years in charge of the Antirabic Clinic of the Brooklyn Department of Health; died at his home in Brooklyn, January 29, from heart disease.

William G. Bradshaw, M.D. College of Physicians and Surgeons, Baltimore, 1881; aged 60; postmaster of High Point, N. C.; a druggist, banker and furniture manufacturer; died at his home, January 19, from cerebral hemorrhage.

Morris Kitay, M.D. University and Bellevue Hospital Medical College, New York City, 1915; aged 27; house physician in the North Hudson Hospital, Weehawken, N. J.; died in that institution, January 25, from pneumonia.

Edward A. Mayberry, M.D. University Medical College, Kansas City, Mo., 1897; aged 47; a Fellow of the American Medical Association; of Enid, Okla.; died recently in Hot Springs, Ark., from disease of the stomach.

William Raiford Eve, M.D. Medical College of Georgia, Augusta, 1867; aged 69; a Fellow of the American Medical Association; of Beech Island, S. C.; died in a hospital in Savannah, Ga., January 21, from heart disease.

Franklin Harvey Haney, M.D. Chicago College of Medicine and Surgery, 1909; aged 38; for thirteen years a pharmacist and practitioner of Illinois; died at his home in Walnut, Ill., January 11, from endocarditis.

George William Coit, M.D. Bellevue Hospital Medical College, 1866; aged 78; of Missouri Valley, Iowa; formerly president of the Iowa Railway Surgeons Association; died in La Jolla, Calif., January 31.

Balthazar Johannes deVogel, M.D. University of Amsterdam, Holland, 1868; aged 69; for more than forty years a practitioner of Hospers, Iowa; died at his home in that place, January 27, from pneumonia.

James C. Chaney, M.D. Memphis Hospital Medical College, Memphis, Tenn., 1895; aged 64; formerly president of the Owasso (Okla.) Board of Health; died at his home in Milo, Okla., January 20.

William J. Williams, M.D. Missouri Medical College, St. Louis, 1878; aged 66; for nearly twenty years a practitioner of Springfield, Mo.; died at his home near that city, January 24, from heart disease.

Major S. Langs, M.D. University of Toronto, Ont., 1865; aged 81; for forty-seven years a practitioner of Suspension Bridge, Niagara Falls, N. Y., and village trustee; died at his home, January 20.

George Isaac Cason, M.D. University of Missouri, Columbia, 1877; aged 62; for several years physician of Colusa County, Calif.; died at his home in Colusa, January 18, from cerebral hemorrhage.

Reuben Waddell Graham, M.D. College of Physicians and Surgeons, Chicago, 1915; aged 23; an intern in the Illinois Steel Company's Hospital, South Chicago, Ill.; died January 31, from diphtheria.

William Alonzo Ellis, M.D. College of Physicians and Surgeons, Boston, 1907; aged 30; died at his home in Essex, Mass., January 25, from pneumonia.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

OXYBON DECLARED FRAUDULENT

The United States Denies the Use of the Mail to the Exploiters of the Oxybon

Another, although probably not the last of the gas-pipe frauds has met its Waterloo. On Jan. 15, 1916, a fraud order was issued by the postmaster-general against the Oxybon Company and Ben A. Hallgren of Chicago, because it is alleged they had been engaged in conducting a scheme for obtaining money through the mails "by means of false and fraudulent pretenses, representations and promises."

The Oxybon has been referred to in THE JOURNAL'S articles on the gas-pipe frauds, which include such well-known humbugs as the Oxydonor, the Oxypathor and the Oxygenor.[1] The Oxybon Company, according to the complete set of advertising matter in THE JOURNAL'S files, had for its "president and general manager" one Dr. G. W. Filloon and for its "secretary and sales manager," Ben A. Hallgren.

The Oxybon, which as a fake did not even have the saving grace of originality, being merely a copy of other devices of the same type, was alleged to be the invention of Dr. Filloon. So far as our records show, Filloon is not a physician. In the medical directories issued during the past thirty years the name of Filloon does not appear except that the issues of 1902 and 1904 contain the name of George W. Filloon, 546 Good Block, Des Moines, Iowa. According to the same directories, the school of graduation of George W. Filloon was the "Metropolitan Medical College" for the year 1899. The Metropolitan Medical College, it will be remembered, was a fraudulent Chicago concern that sold diplomas to anybody that would pay the price. The "Metropolitan" was the successor to the even more notorious "Independent Medical College" of Chicago whose charter was revoked by the Supreme Court of Illinois in 1899. The moving spirit of both the Metropolitan and the Independent Diploma Mills was one J. Armstrong. The federal authorities issued a fraud-order against the Metropolitan Medical College in 1900. Armstrong, according to our records, was fined $500 and sent to jail for eighteen months.

According to the memorandum prepared by the solicitor for the Postoffice Department for the postmaster-general recommending the issuance of a fraud order, the Oxybon Company and Ben A. Hallgren were called on to show cause, on or before Nov. 16, 1915, why a fraud order should not be issued against them. At that time the Chicago postmaster reported that the average amount of mail received by the Oxybon Company was 140 pieces daily. On Nov. 17, 1915, the concern appeared before the solicitor's office, through John F. Voigt, a Chicago attorney, at which time the government's case was presented. At the close of the hearing the Oxybon people were allowed three weeks in which to file the brief and certain evidence in their defense, the mail addressed to the company being impounded in the meantime, pending the conclusion of the case. The evidence submitted by the government and the defense filed by the Oxybon concern were carefully considered and the solicitor in his memorandum to the postmaster-general reported, in part, that he found the facts to be essentially as follows:

"Ben A. Hallgren, under the name The Oxybon Company, at 208 North Fifth Avenue, Chicago, Ill., is engaged in the business of selling a certain device known as an 'Oxybon,' which consists of a metal cylinder filled with a certain compound, to each end of which is attached an insulated wire which terminates in garterlike attachments. The device is to be attached to a person suffering from disease, the cylinder at the same time being immersed in cold water or ice, and

1. A description of these various gas-pipe frauds is published in the Association's pamphlet "Medical Mail Order Frauds," price 10 cents.

the respondents are selling the instrument as a panacea for the cure of practically all human ailments.

"As a preliminary step to secure patients, the respondents insert in magazines and periodicals an advertisement which reads in part as follows:

"BORROW AN OXYBON

"You may now test this wonderful curative invention in your own home.

"Great thirty-day offer.

"Have you failed to find relief? Then all we ask is that you give us an opportunity to demonstrate the worth of our treatment by trying it for 30 days.

"Oxybon is a scientific instrument that floods the body with vital, life-giving oxygen. It relieves in an astonishingly short time all manner of acute and chronic troubles.

"It may be the turning point in your life from sickness to health.

"Send for our two valuable free booklets and particulars of our great offer to-day."

"When a reader answers the advertisement he is sent certain circular matter by the respondents which contains representations to the effect that the Oxybon, when attached to the diseased human body in accordance with certain directions to be furnished by the respondents, will cause the body to absorb increased amounts of oxygen through the skin and pores; that the said device is a scientific instrument which floods the body with oxygen; that the said device raises the resisting power of the human body against disease; that the said device makes everyone supreme master of his own health; that the operation of the said device is in accordance with the law of diamagnetism; that the curative powers of the said device far exceed those of any known method or appliance available to the medical profession; and that through the means indicated the said device will cure practically every human ailment."

OXYBON
Something New! Different! Unexpected! Wonderful!
READ! LISTEN! DON'T MISS! INVESTIGATE!
Here is the best thing ever happened Hundreds of years coming—here at last. So startling you may not believe it at first—yet absolutely true.
INGENIOUS DOCTOR INVENTS
A New Instrument that actually cures disease without the use of medicine
No Medicine! No Belt! No Battery! No Electricity!
Astonishing, but True. Proven Facts. No Experiment. Booklet gives Full Details. Thousands Prove It. Unlike anything you've seen or heard of. It is NOT sold in drug stores
THE OXYBON CO.
208 N. FIFTH AVENUE
CHICAGO, ILL.
OXYBON actually makes nature cure disease by causing the body to absorb oxygen.

A reduced reproduction of one of the Oxybon advertising circulars.

The memorandum then quoted some of the preposterous claims made in the Oxybon "literature." They may be summed up by saying that the Oxybon was claimed to be a cure for practically every known disease — and some that are unknown to medical science. The memorandum continues:

"ABSOLUTELY INERT"

"Government experts, who appeared before this office at the hearing and were subjected to cross-examination by the attorney for the respondents, agreed that the device is absolutely inert and has no power whatsoever either to cause the body to absorb increased amounts of oxygen, to generate any force or influence whatsoever when applied to the body, or to cure disease in any form.

"The contents of the cylinder, which was given a quantitative chemical analysis by the Department of Agriculture, is as follows:

"Moisture, that is volatile material at 100 C... 6.63 per cent.
"Sulphur, as free sulphur..... 47.92 per cent.
"Carbon and other material volatile at red heat 12.00 per cent.
"Ash material, non-volatile at red heat..... 32.65 per cent.

"The contents of the ash consists of iron, aluminum and copper calcium, magnesium, potassium and sodium oxides, phosphates and sulphates.

"Electrical and magnetic tests made at the Bureau of Standards, Department of Commerce, under conditions prescribed in the direction book which accompanies each instrument, disclosed that although the most delicate galvanometers and other instruments were used, the instrument is both electrically and magnetically inert, and, furthermore, that even if any electrical or magnetic force were generated within the instrument, it is effectively short-circuited, so that it would be impossible for the force, if any were produced, to be transmitted to any other object. Identical results were obtained irrespective as to whether or not the cylinder itself was immersed in cold or hot water.

"PROOF" THAT FAILED TO PROVE

"Among the representations in the respondents' literature contained in a booklet entitled 'Oxgen is Life Power' is the following:

"PROOF

"Prove it on a plant. Place the treating plate in the soil of a flower pot containing a plant, and the instrument in cold water, and you will soon see the plant thrive in a surprising way, in a few days. Reverse it by putting the instrument in hot water, and the plant will wither and die. Plants have no 'imagination and no faith.' The Oxybon can no more fail to do good to the human system when rightly applied than sunshine and moisture can fail to grow vegetation, if applied at any reasonable stage.

"Dr. W. W. Stockberger, physiologist in charge of Drug Plants and Poisonous Plant Investigations, in the Bureau of Plant Industry, Department of Agriculture, who appeared at the hearing as a witness for the government, testified that the tests suggested above had been made under his direction and personal observation in one of the greenhouses at the Department of Agriculture."

Dr. Stockberger described the test that had been made under his direction and observation on plants. The Oxybon was used on a number of them according to the directions, immersing the instrument in cold water. No increase in growth was shown in these experiments. The experiment was also made by immersing the Oxybon in hot water but the plants did not "wither and die" as the exploiters of the Oxybon said they would. The expert said that so far as he "could determine by careful inspection and observation the instrument had absolutely no effect whatsoever." The memorandum continues:

"Dr. Lyman F. Kebler, Chief of the Drug Division, Bureau of Chemistry, Department of Agriculture, also appeared at the hearing as a witness for the government, and described certain tests made of the instrument in question on a person suffering from tuberculosis. Although the instrument was applied in accordance with directions for a period of more than a month, no improvement in the patient's condition was noted, and the patient subsequently died."

"CURING" SPINAL CURVATURE, MENORRHAGIA AND HEART DISEASE!

A prominent practicing physician of Washington, D. C., who appeared at the hearing as a witness on behalf of the government stated that, in his opinion, the Oxybon had no curative value whatever. The memorandum further detailed the result of the investigation by Inspector Honvery, a post-office inspector who, by the way, has done excellent work in investigating various medical frauds on the public. To quote:

"Inspector Honvery, in the course of his investigation, wrote certain test letters to the respondents describing certain ailments from which the writer was alleged to be suffering. One letter described the case of curvature of the spine in a girl 13 years of age, and in replies thereto attempts were made by the respondents to sell or rent an Oxybon for the cure of this deformity. . . ."

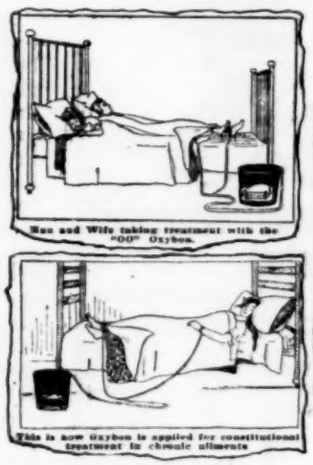
"Another test letter written by Inspector Honvery, under an assumed name, described a case of profuse and steadily

protracted menstruation in a young girl 17 years of age. The respondent's reply thereto, which was not a form letter, stated that Dr. Filloon (the inventor of the Oxybon) had been personally consulted and 'believes that from the way you describe your daughter's case she should get very encouraging results from the use of an Oxybon, as he thinks that the trouble is principally one of weakness of the organ affected, and as soon as Nature can sufficiently strengthen the body through the use of an Oxybon she should again be restored to health,' and also that the Doctor thinks that it would be to your best interest to try an Oxybon on our very liberal trial offer! . . .'"

"Another test letter was addressed by Inspector Honvery to the respondents asking for information whether the Oxybon would be of benefit in treating valvular disease of the heart. In the respondents' reply, dated Feb. 2, 1915, it was stated:

> "I have referred your case to the Doctor and he informs me to write to you that we cannot tell you anything as to the results on account of the seriousness of your trouble. The only thing you can do is to try an Oxybon. Your case has been of so long standing and its progress so far gone that it may be beyond the aid of nature, and if this is the case no treatment can be of any help to you.
>
> "However, you can never tell what this wonderful instrument is going to do until it is applied. . . ."

The government's medical expert testified that the Oxybon could have no effect in these various cases and further that the conditions described by Inspector Honvery were none of them caused by lack of oxygen, although the Oxybon literature declared that: "disease is largely if not wholly due to a deficiency of oxygen in the blood and body." Quoting further from the memorandum:


Man and Wife taking treatment with the "OO" Oxybon.
This is how Oxybon is applied for constitutional treatment in chronic ailments
Mother giving local application in the treatment of Infantile Paralysis.

Reproductions of some of the illustrations (reduced) from an advertising booklet sent out by the Oxybon concern.

"The respondents in defense have made no genuine attempt to meet the case made out by the evidence presented on behalf of the government, and have relied upon certain documentary evidence including affidavits from the respondent Hallgren, and from physicians and others. Hallgren affirms his own faith in the instrument as the result of alleged cures effected upon himself by its use and from statements made to him by Dr. Filloon, the inventor of the instrument.

"Other affidavits relate to tests of the Oxybon on plants and guinea pigs in Chicago. Those who made the tests did not appear at the hearing and were not interrogated by counsel for the government, and whatever inference as to any power in the Oxybon to cure disease might be drawn from these tests standing alone, which appears to be doubtful to say the least, it is clearly refuted by the testimony in behalf of the government already referred to above.

TESTIMONIALS—OF COURSE

"Copies of many alleged testimonials from those who claim to have used the Oxybon with beneficial effects are also submitted by the respondents, who say in their brief:

> ". . . It would seem just to at least attach as much importance to the opinion of a man who claimed to have been sick and to be cured of his sickness and of his opinion of the value of the appliance which affected the cure as to the opinion of medical or other experts of the value of the appliance inasmuch as their opinion [the opinion of experts] is based upon an hypothesis. A man usually knows when he is sick and likewise he knows when he feels well. These letters have more weight than the guesses of experts."

"Assuming that the originals of these testimonial letters were actually received by the respondents, and assuming further that the statements contained therein are frank and sincere, the beneficial results described are doubtless due in large measure to the mental effect caused by the use of a somewhat elaborate and mysterious-looking apparatus. These testimonials may be easily described as falling into one of three classes, viz., they were written either by persons who imagined that they were suffering from disease, when in fact they were not, by persons whose recovery was due to nature, or by persons whose recovery was due to nature and local or hygienic treatment prescribed in connection with the alleged curative agent.

THE WORTHLESSNESS OF TESTIMONIALS

"In this connection, it may be stated that testimonials in general are of small evidentary value in cases of this kind, and are often furnished in good faith by sufferers from chronic ailments who are prone to consider slight temporary or even permanent improvement, due to natural causes, as an evidence of curative value in the device or treatment for which they furnish testimonials. At the hearing it was shown that a patient's diagnosis of his own disease is of very little value.

"The defense in this case fails entirely to meet the government's charges, and is one that might be urged with equal force in defense of any fraudulent mail-order medical concern. If, in fact, this device possessed any of the power claimed for it, the respondents would not have been driven for their defense to testimonials, but would have been able to produce some affirmative proof to meet the burden placed on them by the evidence of the government.

THE DANGER OF SUCH FRAUDS

"When it is remembered that the respondents are selling the Oxybon for the cure of practically all diseases, many of which if allowed to continue without immediate medical or surgical treatment may prove fatal to the patient, and that those who buy the device are lulled into a sense of false security from all disease, necessarily resulting in many cases in a serious or even fatal outcome, which might have been prevented had medical treatment been resorted to, the absolute necessity of prohibiting any further use of the mails wha ever in the sale of this device is apparent.

THE RENTAL TRICK

"Respondents place considerable reliance upon the fact that the Oxybon is sold on trial and call attention to the fact that under a certain 'lease form' entered into with patients, the latter are entitled to a refund less the sum of $5, which is retained by the respondents as rental, in case the purchaser returns the instrument after thirty or before thirty-six days. The names of 340 persons to whom such refunds have been made are also submitted by the respondents. This arrangement in no way alters the fraudulent nature of the business of the company.

"It is well known that many who find themselves defrauded neglect to make complaint, and in any event the fact that a part of the money secured by the false and fraudulent representations above is returned upon demand is a question of degree only. In all cases the patient is at least defrauded of the $5 which he pays as 'rental.'

"In this connection, attention is invited to the following language of the United States Circuit Court of Appeals for the Eighth Circuit in Harris v. Rosenberger, reported in 145 Federal 449, in which counsel for a concern against which a fraud order had been issued, among other grounds in support of a bill to enjoin the execution of the order, urged that a promise to refund the purchase price if the goods in question were not satisfactory and were returned and the fulfilment of that promise in the instances where it was requested showed that there was no intention to defraud:

"'The falsity of the representations and the appellee's knowledge of their falsity being established, as they were, it was not an inadmissible view that the promise to refund the purchase price, if the goods were not satisfactory and were returned, was cleverly devised to give apparent color and support to the representations. True, it appeared that, in a few exceptional instances where customers discovered and resented the deceit which was practiced upon them, the

appellee refunded the purchase price in fulfilment of his promise, but it cannot be said that this necessarily or conclusively disproved any intent to defraud, particularly when it was not questioned that in all other instances he retained the money obtained by means of the deceit which he was practicing.'"

As previously stated, the postmaster-general issued a fraud order against Ben A. Hallgren and the Oxybon Company on Jan. 15, 1916.

Correspondence

The Kinetic Drive

To the Editor:—It has occurred to me that since Professors Carlson and Woelfel have made themselves the sponsors of those who see reasons for questioning the validity of the kinetic theory (THE JOURNAL, Jan. 22, 1916, p. 295), it might be well to pursue with them an open debate in the pages of THE JOURNAL. Certainly if the kinetic theory is false it should be proved so, and that proof should be presented as openly as arguments in favor of that theory have been presented. My proposal would be that this debate be purely on the merits of the case; that it be free from personalities; that each present fully the data on which he founds his opinion regarding any contended point in the discussion; and that the discussion of each point be subject to the generally accepted rules of debate, i. e., that the affirmative have the privilege of final rejoinder.

Will you not let me know whether or not the pages of THE JOURNAL would be open to such a discussion, and if so will you find out whether or not Professors Carlson and Woelfel are ready thus to enter the forum?

G. W. CRILE, M.D., Cleveland.

[The above correspondence was referred to Drs. Carlson and Woelfel, who reply:]

To the Editor:—Our reply to such a proposal might well have been anticipated by Dr. Crile. It seems to us that Dr. Crile before making such a proposal should publish the laboratory and clinical data purporting to substantiate the theory. What sort of a "debate" would that be in which most of the evidence is accessible to one side only? Let Dr. Crile publish his "clinical cases"—especially since he is of the opinion that the validity of the theory must be proved or disproved in the clinics—and all his laboratory data relating to the theory, in such form that one can judge their cogency as evidence and let the essential and new facts be confirmed by others. Such a discussion might be useful.

A. J. CARLSON, PH.D.,
ALBERT WOELFEL, M.D.,
Chicago.

The Signs and Symptoms of Impending Death

To the Editor:—In Dr. Reilly's article on this subject (THE JOURNAL, Jan. 15, 1916, p. 160) there are a number of statements at variance with established beliefs. Dr. Reilly states that the death rattle is associated with pulmonary edema. The death rattle is caused by the air passing through the mucus which collects at the opening of the larynx through inability to remove it by swallowing.

The statement is made that edema of the glottis is invariably fatal. The glottis is the aperture of the larynx. What is probably meant is edema of the larynx. This winter I have seen a number of such cases. All the patients recovered.

ALBERT BARDES, M.D., New York.

[A proof of the preceding was sent to Dr. Reilly, who replies:]

To the Editor:—After reading the criticism of Dr. Bardes, I may say that I am quite well aware of the mechanism of the death rattle as understood by the laity; but, in my experience, when the death rattle is present there is also present an accompanying pulmonary edema. Doubtless the ultimate cause is the same in the two instances for both symptoms. I did not state that edema of the glottis is invariably fatal. This is the case only in elderly patients—those over 45 years of age, in whom a fatal issue may be predicted when this symptom is present. As to the term "edema of the glottis," there may be an honest difference of opinion. Osler regards the term "edematous laryngitis" as synonymous with edema of the glottis, or, more correctly, of the tissues from which the glottis is formed. He prefers the term "edema of the glottis." It is a well established term for describing that terrifying condition which begins with a marked edema of the arytenoepiglottidian folds and false cords and sometimes below the true cords, thus practically closing the air passages. In the aged it is practically always secondary to some other disease, and happy is he who can cure all such cases.

THOMAS F. REILLY, M.D., New York.

Treatment of Diphtheria Carriers

To the Editor:—Your answer to the query of Dr. C. J. March (THE JOURNAL, Jan. 1, 1916, p. 51) is of value, and if the method of treating diphtheria carriers is thoroughly carried out, the mortality from diphtheria will be reduced. It has been proved that patients discharged, after as many as three negative cultures have been obtained from the nose, mouth and throat, were still diphtheria carriers, the diphtheria bacilli being found in abundance in the deep crypts of the tonsil and folds of the adenoids. The customary swabbing of the nose, mouth and throat is not sufficiently thorough to secure a culture from the supratonsillar crypts or the folds of the adenoids, and, therefore, carriers are being discharged to continue in the spread of the disease. Not one carrier of diphtheria has been discovered who has had a complete removal of the adenoids and tonsils.

Your answer would have been simplified had you instructed Dr. March to have the child's tonsils and adenoids completely removed. This would have instantly cured the child of the disease and prevented the patient from becoming a carrier, as well as the incurable complications that this treatment prevents.

T. L. HIGGINBOTHAM, M.D., Hutchinson, Kan.

[COMMENT.—The point to which attention is called by Dr. Higginbotham is a good one. That the removal of the tonsils and adenoids aids in the treatment of diphtheria carriers should have been mentioned.—ED.]

Training of Medical Missionaries

To the Editor:—Apropos the Current Comment on the "Training of Medical Missionaries" (THE JOURNAL, Aug. 21, 1915, p. 723), I am moved to give a bit of personal testimony in the hope that it may, by virtue of its coming as a voice from the other side of the world, have the added effect that Dives hoped for, in his conversation with Abraham, as recorded in the sixteenth chapter of St. Luke. I am not dead, rather very much alive to some things, even more so than when living in America. Here in southern Asia, a doctor must be alive, if he would even attempt to diagnose properly and treat the many diseases that occur in his practice. In America I conceived the idea that a medical missionary should be an "all around doctor." Here I have realized that he must be more than that. If he would be of much service medically to those to whom he is sent, he must not only be a good general practitioner, but also, to be of distinct service, he should have specialized in certain branches. Tell every prospective medical missionary that if the need of the civilized country is not "more doctors, but more doctor," doubly, trebly true is it out here.

Will you bear with me one more word: Let there be places where this additional training can be had by those who have offered themselves for foreign fields *for life*. I have found no place where my appointment to a foreign country gave me any advantage when seeking postgraduate training: not even in the hospitals which call themselves by the name of my church was there a single opening.

PAUL W. VAN METRE, M.D., Nakawn Sritamarat,
Malay Peninsula.
Superintendent, Sritamarat Memorial Hospital.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STROGANOFF'S PROPHYLACTIC TREATMENT OF ECLAMPSIA—CALOMEL IN PREGNANCY

To the Editor:—1. What is Stroganoff's method of treating eclampsia? 2. I should like some information regarding the use of calomel during pregnancy, and dangers of producing abortions and miscarriages. Please omit my name. E. A. L.

Answer.—1. Stroganoff's technic was described in The Journal, July 3, 1909, p. 86. A list of references to articles on his method appear in The Journal, Nov. 30, 1912, p. 1992. His most recent article on this subject was published in *Archiv für Gynäkologie*, 1913, xcix, No. 2. Stroganoff's technic aims to prevent the convulsions by reducing the irritability of the nervous system, obtaining sleep by means of narcotics, removing everything liable to produce irritation, terminating the pregnancy, if necessary, and watching over the regular action of heart, lungs and kidneys. Morphin and chloral are employed, with chloroform at first until the patient feels the effect of the chloral. In moderately severe cases, 0.015 gm. morphin is given first; in one hour or sooner, 2 gm. chloral; morphin again the third hour; chloral the seventh, and 1.5 gm. chloral again the thirteenth and twenty-first hours. If the convulsions continue, delivery is hastened, but surgical measures are seldom necessary.

2. Concerning the relation of calomel to pregnancy, "The Pharmacology of Useful Drugs," p. 289, says, "Calomel has little action on the uterus, and moderate doses are therefore not contraindicated in pregnancy."

GONOCOCCI IN THE CEREBROSPINAL FLUID

To the Editor:—On page 616, Volume I, No. 4, of "The Medical Clinics of Chicago," Dr. Tice makes the statement that the gonococcus is occasionally found (in cerebrospinal fluid). Are there any characteristics, morphologic, staining or cultural, by which the gonococcus could be differentiated from the meningococcus in the cerebrospinal fluid? If so, will you describe them?

H. H. Coleman, M.D., New Philadelphia, Ohio.

Answer.—Although the gonococcus has occasionally been reported in cerebrospinal fluid, these cases are so rare as to be among the curiosities of bacterial localization. They give little practical difficulty.

In general it may be said that the meningococcus grows on mediums more readily than the gonococcus, but as every bacteriologist knows, strains of both organisms are encountered which are cultivated with greater ease or with greater difficulty than the average of their kind, so that absolute dependence could not be placed on this quality. In fact, no method of staining and no morphologic or cultural difference could be relied on without fail for differential diagnosis. Serologic tests would give the best basis for distinction. A summary of all the characteristics is not likely to leave one in doubt about identification.

CLEANING TEST TUBES

To the Editor:—In washing glassware, especially test tubes, I have been troubled with a hazy white discoloration in the tubes that is practically impossible to remove by ordinary means. Will you kindly give me some method by which they can be cleaned quickly and neatly and have a clear luster? W. E. K.

Answer.—The possibility of removing the discoloration depends on what it is due to. If the glass has been etched by alkali, or by the cultivation of bacteria in the tubes, there is no practicable way of restoring it to its original transparency. If the stain is caused by some substance adhering to the glass, special solvents may be required to remove it, but usually the cleaning can be done by treating the glass with a sulphuric acid-potassium bichromate cleaning mixture.

Apportioning the Cost of Health Conservation.—If it is hazardous to human lives to produce an article of human usefulness, then the cost of production should include the cost of the conservation of health.—*Ohio Public Health Jour.*

Medical Education and State Boards of Registration

COMING EXAMINATIONS

Connecticut: Regular, New Haven, March 14-15. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven; Homeopathic, New Haven, March 14. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, March 14. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

Florida: Homeopathic, Jacksonville, March 10. Sec., Dr. J. B. Griffin, St. Augustine.

Maine: Portland, March 14-15. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

Massachusetts: Boston, March 14-16. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

Missouri: St. Louis, March 20-22. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

Wyoming: Laramie, March 14-16. Sec., Dr. H. E. McCollum, Laramie.

Iowa October Report

Dr. G. H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports the written examination held at Des Moines, Oct. 19-21, 1915. The total number of subjects examined in was 8; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 17, of whom 16 passed and 1 failed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Bennett College of Eclectic Medicine and Surgery	(1908)	84
Bennett Medical College	(1914)	88
Chicago Coll. of Med. and Surg.	(1913) 86; (1914) 87; (1915)	86
Chicago Homeopathic Medical College	(1898)	88
Hahnemann Medical College and Hospital, Chicago	(1915)	90
Northwestern University	(1908)	83
Rush Medical College	(1915)	88
University of Illinois	(1913) 92; (1915)	87
Kentucky School of Medicine	(1903)	92
Harvard University	(1901)	90
National University of Arts and Sciences	(1914)	76
Meharry Medical College	(1909)	77
University of Toronto	(1911)	89
FAILED		
Barnes Medical College	(1904)	75.5*

* Fell below the required average in one subject.

Arkansas Eclectic November Report

Dr. C. E. Laws, secretary of the Arkansas Eclectic Medical Board, reports the oral and written examination held at Little Rock, Nov. 9-10, 1915. The total number of subjects examined in was 12; total number of questions asked, 120; percentage required to pass, 75. The total number of candidates examined was 5, of whom 4 passed and 1 failed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Kentucky School of Medicine	(1896)	82.9
Eclectic Medical University	(1906)	81.1, 82.2
University Medical College, Kansas City	(1891)	83.2
FAILED		
Western Eclectic College of Medicine and Surgery	(1908)	51

Delaware December Report

Dr. H. W. Briggs, secretary of the Medical Council of Delaware, reports the written examination held at Dover and Wilmington, Dec. 14-16, 1915. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 6, all of whom passed. Three candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
New York Homeo. Med. Coll. and Flower Hosp.	(1914) 89.9; (1915)	89.2
Hahnemann Med. Coll. and Hosp., Philadelphia	(1915)	85.8, 88.8
Jefferson Medical College	(1914)	81.6
Medico-Chirurgical College of Philadelphia	(1915)	75.1

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
University of Maryland	(1914)	Maryland
University of the City of New York	(1890)	New York
Hahnemann Med. Coll. and Hosp., Philadelphia	(1912)	Penna.

Book Notices

A HANDBOOK OF COLLOID-CHEMISTRY. The Recognition of Colloids, the Theory of Colloids and Their General Physico-Chemical Properties. By Dr. Wolfgang Ostwald, Privatdozent in the University of Leipzig. First English Edition, Translated from the Third German Edition by Dr. Martin H. Fischer, Professor of Physiology in the University of Cincinnati, with the Assistance of Ralph E. Oesper, Ph.D., Instructor in Chemistry, New York University, and Louis Berman, M.D., Staff Physician, Mount Sinai Hospital, New York. Cloth. Price, $3 net. Pp. 278, with 60 illustrations. Philadelphia: P. Blakiston's Son & Co., 1915.

For several years Wolfgang Ostwald has been one of the leading advocates of the importance of the study of the properties of colloids as a special division of chemical and physical science. His book, the third edition of which has now received its first and long overdue translation into English, has been an important agent in the great increase of interest and investigation in this field. Through his energy, a special journal on colloid chemistry, generally known as the *Kolloid Zeitschrift*, has been established. Many Americans will also recall with pleasure the brilliant series of lectures on the fundamentals of colloid chemistry with which, in a tour among our universities a few years ago, he stimulated interest.

From the standpoint of the medical and the biologic sciences, too much stress cannot be laid on the importance of colloidal properties. As Dr. Fischer says in the preface to his translation: "It happens that nature has chosen the colloid form in which to show her face. Crystalloid behavior is the exception, colloid behavior the rule, in the cosmos." The living organism is a mass of colloids, and therefore the more we learn about colloidal properties the more we shall learn of the properties of the living matter.

Anything that is done to further active investigation in this field is to be commended and supported, and hence making Ostwald's standard work accessible to a wider circle is an enterprise that should be cordially endorsed. To all progressive chemists and biologists, the original German editions have been familiar and invaluable. The scope of the book includes consideration of the distinctive features of colloid substances and their characteristic properties. Their particular relation to biologic and industrial chemistry is not discussed, the object of the author being to set forth the fundamental principles of colloid chemistry rather than its application. Hence the book is invaluable to chemists and biologists, but is scarcely available for the medical man who has not specialized in chemistry. He will find more of immediate value in Bechhold's work on "Colloid Chemistry in Biology and Medicine," a stimulating work which still awaits translation.

HOW TO LIVE. Rules for Healthful Living Based on Modern Science. Authorized by and Prepared in Collaboration with the Hygiene Reference Board of the Life Extension Institute, Inc. By Irving Fisher, Chairman, Professor of Political Economy, Yale University, and Eugene Lyman Fisk, M.D., Director of Hygiene of the Institute. Second Edition. Cloth. Price, $1 net. Pp. 345, with illustrations. New York: Funk and Wagnalls Company, 1915.

This book may be regarded as a conservative statement of the principles by which the individual may attain and keep good health, become a better and more efficient citizen, and round out a full, vigorous life. The authors and sponsors of the book—leading hygienists, physicians, publicists and professional men—are surety for the accuracy of the facts, figures and the advice. It must not be assumed that it is a lugubrious compilation of killjoy regulations that the average person would feel inclined to dodge. On the contrary, while endeavoring seriously to impress the reader with his responsibility as a member of society, and with the importance of proper personal hygiene to health and efficiency, and therefore to the "enduring satisfactions of life," it has clothed the assumed dry-as-dust facts regarding health in interesting habiliments, so that the book is reluctantly laid down. One is at once interested, informed and benefited. This book should be a nonfiction "best seller," and physicians should be propagandists in its behalf.

Medicolegal

Municipalities Not Liable for Infection from Negligent Vaccination

(Howard vs. City of Philadelphia (Pa.), 95 Atl. R. 388)

The Supreme Court of Pennsylvania affirms a judgment entered for the defendant notwithstanding that a verdict was rendered in favor of the plaintiff for $5,000 damages for a negligently performed vaccination. The court says that the health authorities of the city of Philadelphia established a quarantine in a certain district within the city limits in which the plaintiff resided, because it was infected with smallpox. The authorities proposed to relieve from the restrictions of the quarantine such of the inhabitants as submitted to vaccination. The plaintiff submitted, and was vaccinated by a physician employed by the board of health, without expense to himself. His vaccination was negligently performed, and as a result another and different infection was introduced into his system, which after some months became so localized and virulent that amputation of one of his limbs became necessary. Suit was brought against the city for the recovery of damages, and the facts above stated were established to the satisfaction of the jury. The one distinctive ground on which the court below rested its conclusions, when it entered judgment for the defendant, notwithstanding the jury found for the plaintiff, was that by general rule municipalities are exempt from liability for the negligent acts of their officers and agents, except in case where the negligence occurs in the performance of some duty which has been imposed by law on the municipality. The rule as thus stated by the court, while correct as far as it goes, leaves something to be supplied because of its conciseness. If it be added to it that, in order to constitute an exception to the rule, the duties so imposed must be imperative, and not discretionary, so as to make clear the distinction between duty and authority or power, and, further, that the duty must relate to the municipality's public or governmental functions, as distinguished from its private or corporate functions and duties, the rule as stated is one which has always been recognized in Pennsylvania, and obtains in most, if not in all, the other states. The law sometimes imposes duties on municipalities which are legislative or judicial in their character, and therefore discretionary. It is only with respect to the performance of these that no liability attaches. With respect to those duties which are absolute and perfect, no exemption can be claimed in their performance. It was not pretended that in this case what the city did was in discharge of a positive and imperative duty imposed on it by law. As little could it be contended that in doing what it did it was exercising a corporate function, for the private advantage and benefit of its inhabitants. It is clear beyond question that the negligence here complained of did not fall within the exception to the general rule in regard to municipal exemption, and that the general rule as above stated here governed.

Incompetent Testimony of Physician in Inquisition of Lunacy

(In re Gates (N. Y.), 154 N. Y. Supp. 782)

The Supreme Court of New York, Appellate Division, Third Department, in reversing an order affirming the findings of an inquisition of lunacy and granting a new hearing, says that it was error to permit the defendant's personal physician to testify as to the competency of his patient. Clearly it was indelicate for a physician in attendance on a patient to permit himself to be hired by another and go and make an examination of the patient for the purpose of testifying against him. In the judgment of the court it was not only indelicate, but in violation of the privilege given to the patient under Section 834 of the New York Code of Civil Procedure. It was also error to permit a physician, in forming his opinion as to the competency of the alleged incompetent, to base it in part on his understanding and recollection of the evidence given by the petitioner's witnesses in court. If the petitioner wished to avail himself of anything brought out by the examination,

the alleged fact should have been incorporated in a hypothetical question. The physician, by the question put to him, was called on to form a conclusion as to what the evidence had established.

State Board of Health Not Authorized to Employ an Attorney

(Fergus et al. vs. Russell, State Treasurer, et al. (Ill.), 110 N. E. R. 130)

The Supreme Court of Illinois says, in this suit to restrain the payment out of the state treasury of certain appropriations made by the general assembly, that the statute gives the State Board of Health no power or authority to employ an attorney, but, on the contrary, by Section 7 of Chapter 126a (Hurd's Statutes of 1913, page 2288), it is provided that in all prosecutions and proceedings instituted by the State Board of Health it shall be the duty of the state's attorney in each county to prosecute.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans

January, III, No. 7, pp. 367-422

1 Study of Endameba Buccalis in Alveolodental Pyorrhea. F. M. Johns, New Orleans.
2 Dietetic Treatment of Sprue. B. K. Ashford, Porto Rico.
3 Complement Deviation Reaction Applied to Diagnosis of Moniliasis of Digestive Tract. I. G. Martinez, San Juan, Porto Rico.
4 Control of Asiatic Cholera on International Trade Routes. A. J. McLaughlin, Washington.
5 Case of Sprue with Necropsy. E. H. Falconer, San Francisco, and A. H. Rowe, Boston.
6 Breeding Places of Anopheles. H. P. Barret, Charlotte, N. C.
7 Intestinal Parasites of Isthmus of Tehuantepec. A. K. Moillet and F. Carreno.

Annals of Otology, Rhinology and Laryngology, St. Louis

September, 1915, XXIV, No. 3, pp. 429-746

8 Suspension Laryngoscopy and Its Accomplishments. R. C. Lynch, New Orleans.
9 Focal Infection in Etiology of Labyrinth Disease. G. E. Shambaugh, Chicago.
10 Infection of Ear with Vincent's Micro-Organisms; Report of Sixteen Cases. J. A. Mulholland, New York.
11 Transplantation of Cartilage in Correction of Septal Deformities. F. O. Lewis, Philadelphia.
12 Report of Some Unusual Cases of Disease of Nasal Accessory Sinuses. J. R. Winslow, Baltimore.
13 Surgical Diseases of Superior Maxilla. W. P. Barndollar, Pittsburgh.
14 True Myxoma of Rhinopharynx; Report of Two Cases. V. Dabney, Washington.
15 Report of Two Cases of Mastoid Abscess, Infective Thrombosis of Lateral Sinus and Jugular Vein; Resection of Jugular; Recovery. J. H. Bryan, Washington.
16 Cases of Lateral Sinus Thrombosis. G. W. Boot, Chicago.
17 Case of Brain Abscess with Unusual Findings. G. L. Richards, Fall River, Mass.
18 Case of Otitis Media and Mastoiditis Followed by Meningitis, Operation, Recovery. After Eight Years, Development of Cerebral Abscess Operation, Death. S. J. Kopetzky, New York.
19 Roentgenographs of Mastoid in Certain Atypical Cases. H. Hays, New York.
20 Standard Tonsillectomy. J. R. Fletcher, Chicago.
21 Local vs. General Anesthesia in Nose and Throat Operations. J. C. Beck, Chicago.
22 Decompression for Relief of Choked Disk Following Thrombosis of Lateral Sinus. H. Friedenwald and J. W. Downey, Jr., Baltimore.
23 Inferior Turbinate. J. A. Cavanaugh, Chicago.
24 Some Statistic Observations on Otolaryngologic Diseases Among Negroes, Based on Fifteen Hundred Cases. D. Roy, Atlanta.
25 Acute Hemorrhagic Mastoiditis. H. W. Loeb, St. Louis.
26 Tonsil Operation; Inquiry into Actual Results Obtained in Series of Cases. D. J. G. Wishart, Toronto.
27 Case of Traumatic Mastoiditis. C. J. Imperatori, New York.
28 Facial Contractions During Radical Mastoid Operation. C. E. Perkins, New York.
29 Differential Diagnosis of Laryngeal Motor Paralysis. O. J. Stein, Chicago.
30 Case of Acute Meningitis Associated with Acute Suppurative Otitis Media, Both Produced by Streptococcus Mucosus Capsulatus. R. L. Loughran, New York.
31 Case of Acute Exacerbation of Chronic Mastoiditis with Cholesteatoma, Extensive Epidural Abscess, Purulent Pachymeningitis, with Exploratory Incision of Dura and Lateral Sinus; Recovery. R. L. Loughran, New York.
32 Labyrinth Probe. F. R. Spencer, Boulder, Colo.

Archives of Pediatrics, New York

December, 1915, XXXII, No. 12, pp. 881-950

33 *Foreign Body Pneumonias. A. Caillé, New York.
34 Disseminated Miliary Tuberculosis. W. F. Northrup, New York.
35 Value of Roentgen Ray in Intrathoracic Lesions in Children. R. G. Freeman, New York.
36 Case of Amaurotic Family Idiocy in One of Twins. C. Herrman, New York.
37 *Macewen's Sign. H. B. Wilcox, New York.

33. **Foreign Body Pneumonias.**—In one of the cases cited by Caillé the spasmodic character of the cough, the expectoration of pus in an acute lesion, in the absence of amphoric breathing such as we find in cavity formation, gave rise to the suspicion of a foreign body irritation. The roentgenogram revealed a large tack, with a large round head, in the right lung. Rapid improvement followed the removal of the tack with the aid of the bronchoscope guided by the fluoroscope. The physical signs cleared up, and the child was discharged cured. The tack had been lodged in the lung about five weeks. In the second case the roentgenogram showed a large nail in the left bronchus and partly in the trachea. A lower tracheotomy was performed and the nail removed with the aid of the bronchoscope. In the third case a shawl pin was found in the left bronchus and lung, the point projecting at the bifurcation in the trachea. During a severe spasmodic coughing spell the patient coughed up the 2½ inch long brass shawl pin. The pin had been in the child's lung forty-three days without inducing local inflammation.

37. Abstracted in The Journal, June 26, 1915, p. 2167.

Arkansas Medical Society Journal, Little Rock

January, XII, No. 8, pp. 189-212

38 Obstetric Technic. E. C. Meyers, Fort Smith.
39 Anent General Practician. D. Smith, Hope.
40 *Heart Inhibition During Vomiting. D. Gann, Jr., Little Rock.
41 Practical Laboratory Diagnosis. J. C. Simpson, Hamburg.

40. **Heart Inhibition During Vomiting.**—Gann says that while experimenting on intrathoracic and intra-abdominal pressures, the blood pressure was observed to fall during vomiting. A series of experiments were performed to determine the cause of this fall. In all experiments the blood pressure, the intrathoracic pressure and the movements of the abdominal wall were recorded. Vomiting was induced in some cases by means of apomorphin; in others by filling the stomach with hot salt solution, hot soap suds, copper sulphate solution, etc. In every case a high negative pressure was observed in the thorax during the act. The pressure would fluctuate rapidly from zero to twenty-five or thirty centimeters (water) of negative pressure. The blood pressure, however, always fell, sometimes to less than half its former level. The fall in blood pressure was found to be due to a vagus inhibition of the heart, for on cutting the vagi while the vomiting was taking place, and while the blood pressure was at its lowest, there was an immediate increase in heart rate and rise to above the normal in blood pressure. Furthermore, when the vomiting was induced after the vagi had been cut, there was a rise instead of a fall in blood pressure.

Boston Medical and Surgical Journal

January 27, CLXXIV, No. 4, pp. 109-150

42 Orthopedic Work in War Hospital. R. B. Osgood, Boston.
43 Anthropologic Comments on So-Called "Herbivorous" and "Carnivorous" Types of Man. E. A. Hooton, Cambridge.
44 Mutism and Deafness Due to Emotional Shock Cured by Etherization. D. P. Penhallow, Boston.

Indiana State Medical Association Journal, Fort Wayne

January, IX, No. 1, pp. 1-44

45 Case of Hysteria from Viewpoint of Freudian Psychology. M. A. Bahr, Indianapolis.
46 Position of Otolaryngology Among Specialties. J. F. Barnhill, Indianapolis.

Iowa State Medical Society Journal, Des Moines

January, VI, No. 1, pp. 1-40

47 Classification and Treatment of Chronic Cryptogenetic Splenic Tumor; Splenectomy. W. E. Sanders, Des Moines.
48 Diagnosis of Osteomyelitis. M. J. Kenefick, Algona.
49 Cooperation; What Does It Mean? C. E. Harris, Grinnell.
50 Detail of Worth's Muscle Exercises and Other Treatment for Strabismus (Concomitant). C. C. Walker, Des Moines.
51 Use of Duodenal Tube. J. F. Churchill, Chicago.
52 Slight Injuries in Syphilitic Patients. T. H. Glenn and W. R. Bates, Fort Dodge.
53 *Hay-Fever Producing Weeds in United States. W. Scheppegrell, New Orleans.

53. **Hay-Fever Weeds in United States.**—The object of the American Hay-Fever Prevention Association of which Scheppegrell is president, is defined by him as follows: The dissemination of general knowledge of benefit to sufferers from hay-fever, the education of the public regarding the weeds that are known to produce this disease, and the use of its influence and cooperation toward the eradication of such weeds. By means of lectures and articles in the scientific and public press, it is endeavoring to educate the public in the relation of certain weeds to hay-fever, and the best methods for their avoidance and eradication.

Journal of Biological Chemistry, Baltimore

January, XXIV, No. 1, pp. 1-89

54 *Experimental Diabetes after Pancreatectomy. A. A. Epstein and G. Baehr, New York.
55 *Effect of Phlorhizin on Formation of Glycogen in Liver. A. A. Epstein and G. Baehr, New York.
56 Use of Phlorhizinized Dogs to Determine Utilizable Carbohydrate in Foods. W. D. Sansum and R. T. Woodyatt, Chicago.
57 Can Carbon Dioxid in Sea Water Be Directly Determined by Titration? S. Morgulis and E. W. Fuller, Woods Hole, Mass.
58 Stability of Growth-Promoting Substance in Butter Fat. T. B. Osborne and L. B. Mendel, New Haven, Conn.
59 Cephalin. Brain Cephalin. P. A. Levene and C. J. West, New York.
60 Glucosaminoheptonic Acid. P. A. Levene, New York.
61 Ammonia Derivatives of Sugars. P. A. Levene, New York.
62 Sphingosin. Some Derivatives of Sphingosin and Dihydrosphingosin. P. A. Levene and C. J. West, New York.
63 Sphingomyelin. P. A. Levene, New York.

54. **Diabetes after Pancreatectomy.**—Epstein and Baehr found that the hyperglycemia in experimental diabetes after pancreatectomy in the cat mounts progressively in the terminal stages of the condition because of diminution in the permeability of the kidneys. This they believe furnishes an explanation of the excessive rise in the blood sugar of diabetics prior to the development of coma. Experimental interference (by double nephrectomy) with the glucosuria of depancreatized animals also causes a rapidly progressing hyperglycemia. This accumulation of sugar in the blood is said to be largely due to the gradual mobilization of carbohydrate from the liver and muscles.

55. **Phlorhizin and Formation of Glycogen.**—Phlorhizin, Epstein and Baehr say exerts a specific effect on the liver which does not become evident unless the kidneys are removed. In other words, phlorhizin in some way stimulates the liver to build up glycogen. With the kidneys intact, the glucosuric action of phlorhizin is so much more powerful than this liver action that the glycogen accumulations in the liver are rapidly diminished. On removal of the kidneys, however, the glucosuric action is eliminated and the effect on the liver becomes manifest in a rapid building up of glycogen, even in a state of extreme starvation.

Journal of Experimental Medicine, Baltimore

February, XXIII, No. 2, pp. 149-264

64 *Pathologic Effects of Atmospheres Rich in Oxygen. H. T. Karsner, Cleveland.
65 Inhibition of Toxicity of Uranium Nitrate by Sodium Carbonate. W. deB. MacNider, Chapel Hill, N. C.
66 *Intratesticular Implantation of Flexner-Jobling Rat Carcinoma. W. H. Woglom, New York.
67 *Experimental Syphilis in Rabbit Produced by Brain Substance of Living Paretic. U. J. Wile, Ann Arbor, Mich.
68 *Study of Gastric Ulcers Following Removal of Suprarenals. F. C. Mann, Rochester, Minn.
69 *Transplantable Carcinoma of Guinea-Pig. F. S. Jones, New York.
70 Preservation of Living Red Blood Cells in Vitro. Methods of Preservation. P. Rous and J. R. Turner, New York.
71 Id. Transfusion of Kept Cells. P. Rous and J. R. Turner, New York.
72 Cause of Rat-Bite Fever. K. Futaki, F. Takaki, T. Taniguchi, and S. Osumi, Tokyo.
73 Biology of Peripheral Nerves in Transplantation. R. Ingebrigtsen, Christiania, Sweden.

64. **Atmospheres Rich in Oxygen.**—The studies reported by Karsner show that atmospheres containing 80 to 96 per cent. oxygen under normal barometric pressure produce in twenty-four hours, or more commonly forty-eight hours, congestion, edema, epithelial degeneration and desquamation, fibrin formation, and finally a pneumonia, probably of irritative origin and to be described as a fibrinous bronchopneumonia. The important new points are the time relations of these changes and definition of the type of the pneumonia. Other studies have noted slight passive congestion, but it is now established by Karsner that this is to be accounted for in most cases by dilatation of the right side or of both sides of the heart. This congestion affects all the abdominal viscera and is accompanied by certain secondary changes such as cloudy swelling of the parenchymatous organs and phagocytosis of erythrocytes by endothelial cells of the mesenteric lymph nodes. Although deficiency of oxygen may affect the hematopoietic system, the animals subjected to high oxygen percentages failed to show any demonstrable pathologic changes in blood, spleen, lymph nodes, or bone marrow, except for the presence of congestion.

66. **Flexner-Jobling Rat Carcinoma.**—Rats were inoculated by Woglom in both testes and in the right axilla, each series at the same sitting and with an equal dose of the same tumor. From three to seven days afterward, the tension in the left testis was lowered by incising the tunic through an abdominal incision under ether anesthesia, while the right testis was left undisturbed as a control. The tumors in the opened (left) gland were not invariably larger than those in the unopened, as they would be were tension alone responsible for the smaller size of intratesticular growths. That the release of pressure may occasionally exert some slight favorable influence, however, is suggested by the fact that neoplasms in the opened testis had in several cases grown through the incision in the tunic; furthermore, these growths were sometimes larger than those in the opposite testis. That is to say, in thirty-nine rats, in which grafts succeeded in both testes, a distinctly larger tumor was found in the opened gland in twelve, while in only six was the nodule on this side smaller than that in the intact organ; in twenty-one rats, the intratesticular growths were of uniform size. The absence of metastases in the abdominal cavity, supports the observation of Jones and Rous, that the peritoneum, in animals at least, is not susceptible to metastatic attack unless the subendothelial connective tissues have been injured.

67. **Experimental Syphilis in Rabbit.**—Wile repeated the inoculation experiments of Forster and Tomasczewski. Six cases were chosen from a large number of paretics. The diagnosis from the clinical findings and from the spinal fluid was frank general paralysis. The material was obtained from the brain. In five of the six cases spirochetes were demonstrable. The major portion of the material thus obtained was at once injected into the testes of a large rabbit. The material from five patients was injected into the left organ and that from one patient into the right. About two weeks after the inoculation, small hard nodules could be felt in both organs. Aspiration of the nodules after four weeks showed large numbers of active, motile spirochetes. These continued to be demonstrable up to the eleventh week after inoculation, when the animal died from an accidental trypanosome infection, the nature of which was not determined. When the organisms were first demonstrable a second rabbit was inoculated from the aspirated testicular juice of the first animal. Twenty-one days later, both testes were found to be the sites of hard nodules, from which again on aspiration, large numbers of spirochetes were demonstrable. These continued to be demonstrable in the second rabbit for five weeks, up to the time of the death of this animal from the same accidental infection. A third rabbit was inoculated with the aspirated testicular juice of the second, and fifteen days after inoculation small nodules appeared in both testes, in which again large numbers of organisms could be found on repeated examinations.

68. **Gastric Ulcers Following Removal of Suprarenals.**—In over 100 experiments made by Mann lesions of the gastric and duodenal mucosa did not occur in suprarenalectomized animals subject to continuous etherization and were infrequent in animals subjected to the removal of only one suprarenal; but lesions in the stomach and duodenum occurred in about 90 per cent. of the animals dying with the characteristic symptoms of suprarenal insufficiency after removal of both glands. The lesions found in the gastric mucosa after death from suprarenal insufficiency consist of two main types; one is a widespread, superficial erosion; the other is a true, punched-out ulcer formation. The gastric erosions practically always occurred in the fundic division, and in most cases the pyloric mucosa appeared normal. The gastric ulcers were usually multiple, but a few stomachs contained only one ulcer. Their position varied; they were found in the fundic and pyloric regions on both the greater and lesser curvatures. Usually they occurred in the prepyloric division. The duodenal mucosa was usually congested in the suprarenalectomized animals. In five experiments there were definite ulcers. These duodenal ulcers occurred just distal to the pyloric ring and appeared like cauterized areas about 1.5 cm. in diameter. The gastric content was always acid in the suprarenalectomized animals. In a series of ten experiments in which sodium bicarbonate was administered after the removal of the last suprarenal, ulcers were found in one animal only. This result would tend to show, as has been demonstrated in regard to the formation of other acute ulcers, that acid is a factor in their production. In a series of ten experiments a gastro-enterostomy was performed during the interval between the removal of the suprarenals. In only four of these animals were ulcers found. It is possible to explain this result as due to a reflux of the alkaline intestinal secretion and the bile.

69. **Transplantable Carcinoma of Guinea-Pig.**—An adenocarcinoma of the mammary gland of an old guinea-pig has been successfully transplanted by Jones through eight successive series of animals. It now appears much earlier and grows more rapidly. The number of takes also has increased. In two instances metastasis to the regional lymph glands (inguinal) has been observed. Once microscopic metastases were found in the kidney. The so-called precancerous changes observed in the breasts of women and mice suffering from mammary carcinoma were found in the mammary gland of the spontaneous tumor animal.

Journal of Infectious Diseases, Chicago

February, XVIII, No. 2, pp. 131-238

74 *Mode of Infection in Pulmonary Distomiasis. Certain Fresh-Water Crabs as Intermediate Hosts of Paragonimus Westermanii. K. Nakagawa, Formosa, Japan.
75 Milk Borne Paratyphoid Outbreak in Ames, Iowa. M. Levine and F. Eberson, Ames, Iowa.
76 Variations in Reaction of Blood of Different Species as Indicated by Hemolysis of Red Blood Cells when Treated with Acids or Alkalies. J. G. Cumming, Boston.
77 *Physical Chemistry of Disinfection. J. F. Norton and P. H. Hsu, Boston.
78 *Diphtheroid Bacillus of Freisz-Nocard from Equine, Bovine and Ovine Abscesses. I. C. Hall and R. V. Stone, Berkeley, Calif.
79 Precipitation of Typhoid Bacillus by Means of Definite Hydrogen Ion Concentration. C. F. Kemper, Boulder, Colo.
80 *Leptothrix Associated with Chronic Hemorrhagic Nephritis. G. R. Dick, G. F. Dick and B. Rappaport, Chicago.
81 Endamebae of Mouth. Endameba Gingivalis (Buccalis). C. F. Craig, Fort Leavenworth, Kan.

74. **Infection in Pulmonary Distomiasis.**—Of three species of fresh-water crabs examined by Nakagawa the encysted larvae of the human lung distomes were found in two, the occurrence in the third being problematical. The liver, the gills, and other organs of the crab that harbored a large number of encysted larvae were given to two puppies. One of the dogs died sixty days after feeding. Postmortem examination showed the lungs to have a number of cysts. Within each cyst two or three distomes were present. They had no eggs in the uterus at this time. The other puppy died after a lapse of ninety days from feeding. His lungs contained numerous cysts, in which adult distomes with eggs ready to be discharged were found. Further observation showed that the encysted larvae that have been taken into the alimentary canal of the host, creep out of the cysts and making their way through the intestinal wall near the jejunum, reach the abdominal cavity. They then penetrate the diaphragm and reaching the thoracic cavity, scatter all over the space under the pleura, whence they can easily find their way to the lung. They pierce the lung parenchyma, and there the cysts are formed until they become fully grown. These parasites can bore through various tissues and may reach other organs than the lung, where they form their regular cysts; but the lung seems to be the most favorable place for their development and the laying of their eggs; in other organs they can never reach the perfect growth.

77. **Physical Chemistry of Disinfection.**—Norton and Hsu summarize their work as follows: Acids act as disinfectants through the agency of the hydrogen ions produced by electrolytic dissociation. The disinfecting power of an acid is approximately proportional to the hydrogen ion concentration. The addition to an acid of a salt containing an anion common to this acid, diminishes its disinfecting power, as the result of a decrease in the hydrogen ion concentration and an increase in the concentration of the undissociated acid molecules. Salts which do not appreciably affect the dissociation of an acid, greatly increase the disinfecting properties of the acid. Acid anions are positive catalyzers and undissociated acid molecules are negative catalyzers in acid disinfection.

78. **B. Preisz-Nocard in Animal Infections.**—Hall and Stone isolated *B. Preisz-Nocard* from characteristic abscesses in eleven horses and one calf. *B. Preisz-Nocard* is a diphtheroid bacillus, presenting characteristics as follows: (1) the production of orchitis in guinea-pigs, as well as suppurative processes generally throughout the lymphatics; (2) the hemolysis of blood agar plates not containing an excess of fermentable carbohydrate; (3) the elaboration of a soluble toxin, resembling but not identical with that of diphtheria, yet being neutralized partly by diphtheria antitoxin. This apparent partial neutralization suggests the existence of group reactions among soluble bacterial toxins analogous to the group reaction of precipitins and agglutinins. The authors also draw attention to the uncertainty of experimental orchitis in guinea-pigs as a certain test for glanders, and emphasize the necessity of microscopic and cultural examination of pus from such lesions for diagnostic purposes.

80. **Leptothrix in Chronic Nephritis.**—The authors report a case of chronic nephritis, characterized by frequently recurring attacks of hematuria extending over a period of three years, and by leptothrix in large numbers in the urine. The presence of the leptothrix in the urine is not accepted as proof that it caused the nephritis and hematuria with which it was associated, but the large numbers in which it was found, its toxicity for animals, and the marked improvement of the patient during vaccine treatment suggests a causal relation. The patient received 3 doses of a vaccine from the leptothrix. After the third dose, the urine, which had been macroscopically free from blood, became very bloody for three days. Though she had previously had attacks characterized by general malaise and large amounts of blood in the urine at intervals of three to thirty days, another one did not occur during the next sixteen weeks. Red cells were still found in the urine after the fourth and fifth injections. After the ninth injection no erythrocytes were found in the urine; it still showed an occasional hyalin or granular cast. The patient meanwhile had gone back to work and had resumed active outdoor exercise. The urine remained free from red cells the following nine weeks that she was under observation. Injections of one-half-million doses at intervals of one to two weeks were continued.

Journal of Nervous and Mental Disease, Lancaster, Pa.

January, XLIII, No. 1, pp. 1-104

82 Critical Historical Review of Reil's Rhapsodieen. W. A. White.
83 Family Form of Pseudosclerosis and Other Conditions Attributed to Lenticular Nucleus. W. G. Spiller, Philadelphia.
84 *Speech Conflict — Natural Consequence in Cosmopolitan Cities — As Etiologic Factor in Stuttering. M. K. Scripture and O. Glogau, New York.

84. **Speech Conflict.**—In order to throw some light on the etiology of stuttering as met with in the cosmopolitan city of New York Scripture and Glogau went over the histories of 200 cases of stuttering. The analysis of their statistics makes them conclude that speech conflict is an etiologic factor in stuttering. Among 171 male patients there were 33 whose stuttering was apparently brought about by speech conflict exclusively, while in 4 cases negligent lisping in their own language had previously existed. Among the 29 female patients there was only one to whom this cause could be attributed. The most striking feature concerning these stutterers from speech conflict is the fact that their stuttering was acquired at the ages of 5 to 7 years. Only in one instance was this later; the age was 9 years and this was explained by the fact that the patient came from Russia at the age of 7 and was therefore only confronted with the problem of speech conflict at a later age than other children. Sixteen children started stuttering at the age of 6; seventeen at the age of 5 and four at the age of 7. It is interesting to see that the onset of stuttering, either psychic or organic, may be from the ages of 1 to 15, while the stuttering from speech conflict occurs only at the ages of 5 to 7. In thirty-eight cases the etiologic factor proved to be a conflict between the mother tongue at home and English to be learned in school. This speech conflict as an etiologic factor in stuttering is almost exclusively met with in the Jewish child, and particularly in the male sex.

Journal of Parasitology, Urbana, Ill.

December, 1915, II, No. 2, pp. 51-98

85 Comparison of Endameba Gingivalis (Gros) and Endameba Histolytica Schaudinn. A. J. Smith and M. T. Barrett, Philadelphia.
86 Trematode Genus Telorchis with Descriptions of New Species. H. W. Stunkard, Urbana.
87 *Insect Vector of Uta (Lupus Vulgaris), Peruvian Disease. C. H. T. Townsend, Washington, D.C.
88 Filaria Cingula Parasitic in Skin of Cryptobranchus Allegheniensis. F. H. Krecker, Cincinnati.
89 Life History of Gongylonema Scutatum. B. H. Ransom and M. C. Hall.
90 Stage of Piroplasma Bigeminum which Occurs in Cattle Tick, Margaropus Annulatus. H. Crawley, Washington, D. C.

87. **Insect Vector of Uta, Peruvian Disease.**—The disease known as uta, occurring on the west face of the Andes in Peru, has been proved to be due to a leishmania. Townsend suggests that it is highly probable that the various forms of leishmaniasis thus far known are due to as many species of herpetomonads originally parasitic in the intestine of the insect carriers concerned, and that, with regard to the occurrence in man, these herpetomonads are as yet in the stages of parasitism ranging from habitually abnormal or frequent to merely accidental or infrequent.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

December, 1915, VII, No. 5, pp. 557-617

91 *Absorption of Potassium Iodid by Perfused Thyroid Glands and Some of Factors Modifying It. D. Marine and H. O. Feiss, Cleveland.
92 *Physiology of Stomach Action of Bitter Tonics on Secretion of Gastric Juice. L. D. Moorhead, Chicago.
93 *Central Action of Digitalis as Tested by Cardio-Inhibitory Center. C. W. Greene and J. O. Peeler, St. Louis.
94 *Influence of Some Drugs Used in Treatment of Gout (and Arthritis) on Elimination of Uric Acid and Other Waste Products from Blood. W. Denis, Boston.

91. **Absorption of Potassium Iodid.**—According to Marine and Feiss artificially perfused thyroids take up and retain potassium iodid to the same extent that in vivo perfused thyroids do. This characteristic is not shared by the liver, kidney, spleen or muscle. The amount of potassium iodid retained is independent of its concentration in the perfusion fluid. Only surviving glands exhibit the ability of taking up potassium iodid. Potassium cyanid inhibits this activity of the thyroid. It is possible to wash out with defibrinated blood a small amount of the iodothyreoglobulin in an hour's perfusion even in intact glands rich in iodothyreoglobulin. Autolyzing glands do not take up potassium iodid, and rapidly give up their stored iodin in the perfusate. The potassium iodid stored in a thyroid gland from one hour's perfusion, whether in vivo or in vitro, is pharmacologically inactive.

92. **Action of Bitter Tonics on Secretion of Gastric Juice.**—The results on normal dogs with respect to appetite and the quantity and quality of the gastric secretion, Moorhead says, indicate the following conclusions: 1. These bitters, acting either in the mouth or in the stomach, have no appreciable influence on the appetite. 2. These bitters, acting either in the mouth or in the stomach, have no consequential influence on the quantity of the gastric secretion, although a slight uniform depression is noted from their action in the stomach. 3. These bitters, acting either in the mouth or in the stomach, have no significant influence on the quality of the gastric secretion, although a slight rather uniform depression is observed in the free as well as in the total acidity from the action of the drugs in the mouth. Moorhead's results with respect to appetite and the quantity and quality of the gastric secretion of cachectic dogs indicate the following conclusions: 1. These bitters, acting both in the mouth and in the stomach, exert a favorable influence on the appetite. The increase produced is not sufficient to bring the amount of food consumed up to normal, but the influence is definite and significant. 2. These bitters acting in the mouth cause an increase both in the quantity and quality of the gastric juice secreted during the hour following the meal. The qualitative increase is observed in both the free and total acidity, while the pepsin concentration remains fairly constant. The increase, it is true, is not great enough to bring either the quantity or the quality of the juice up to that secreted by the normal dog, but this increase is marked enough to be worthy of note. These bitters, acting in the stomach, have no appreciable influence on the quantity or the quality of the gastric secretion.

93. **Action of Digitalis as Tested by Cardio-Inhibitory Center.**—Greene and Peeler found that digitalis strongly and directly stimulates the cardio-inhibitory center of the medulla. Paralysis of the center by excessive action is shown by the escape of the heart during perfusion and by the failure of subsequent perfusions to produce inhibition. Cumulative and persistent action on the inhibitory nerve center is indicated by the recurrence of various degrees of inhibition during subsequent perfusion with Ringer's solution. Not only is the rhythm inhibited, but there is a blocking of the passage of the contraction wave from the veins and sinus to the ventricle by a decrease in conductivity.

94. **Influence of Drugs in Treatment of Gout.**—Benzoic acid when administered to men in large doses (8 gm. per day) increases the uric acid excretion in the urine and decreases the uric acid content of the blood. Cinnamic acid in the comparatively small doses used (4 to 6 gm. per day) had little if any effect. Quinic acid and colchicum have also no effect on the uric acid elimination. The same is true of para-oxybenzoic acid which shows none of the power possessed by its homologue, salicylic acid, of producing a lowered kidney threshold for uric acid. None of these drugs produce any change in the nonprotein nitrogen content of the blood. Benzoic acid, aspirin and atophan were found to have no effect on the creatin content of the blood.

Maine Medical Association Journal, Portland

January, VI, No. 6, pp. 221-252

95 Study of Heart Beat with Especial Reference to Its Rate. P. D. White, Boston.
96 Chronic Gastric and Duodenal Ulcer. W. H. Bradford, Portland.
97 Acidosis. C. M. Robinson, Portland.

Medical Record, New York

January 22, LXXXIX, No. 4, pp. 135-176

98 Radium. C. E. Field, New York.
99 Health Insurance. E. H. Lewinski-Corwin, New York.
100 Reduction of Obesity. A. W. Ferris, Saratoga Springs.
101 Dangers of Hasty Diagnosis of Pulmonary Tuberculosis. M. Fishberg, New York.
102 Peptic Ulcer from Point of View of Medical Selection. H. W. Cook, Minneapolis.
103 Changing Falsetto Voice to Baritone. F. M. Hallock, New York.

January 29, No. 5, pp. 177-222

104 Tobacco Habit. R. Abbe, New York.
105 Enzyme Theory of Cancer Etiology. L. D. Bristol, University, N. D.
106 Trigger Finger. A. B. Judson, New York.
107 Syphilitic Roseola Limited to Soles. D. W. Montgomery, San Francisco.
108 Mystery of Anteflexed Uterus. G. K. Dickinson, Jersey City, N. J.
109 Case of Herpes Zoster Presenting Multiple Symptoms and at One Stage Simulating Mastoiditis. J. Weinstein, New York.
110 Fericystitis Complicating Acute Appendicitis. E. H. Eising, New York.

New Mexico Medical Journal, Las Cruces

January, XV, No. 4, pp. 133-165

111 Use of Free Omental Grafts in Abdominal Surgery. L. Freeman, Denver.
112 Use of Bone Transplant in Fractures. A. W. Morton, San Francisco.
113 Impotence. F. F. Fadely, Albuquerque.
114 Pellagra. W. G. Hope, Albuquerque.
115 Case of Periprostatic Abscess of Tuberculous Origin. F. H. McKeon, Fort Stanton.

New York Medical Journal

January 29, CIII, No. 5, pp. 193-240

116 Infantile Paralysis. R. T. Taylor, Baltimore.
117 Irritation as Factor in Malignant Tumor Development. G. L. Rohdenburg, New York.
118 Postoperative Complications of Appendicitis. J. Wiener, New York.
119 Ductless Glands and Atypical Growth. S. W. Little, Rochester.
120 Treatment of Infections of Accessory Sinus. A. M. MacWhinnie, Seattle, Wash.
121 Gastro-Intestinal Symptoms and Eye Strain. A. Brav, Philadelphia.
122 *A Violet and Brown Stain for Tubercle Bacilli. E. Klein, Bayonne, N. J.

122. **Violet and Brown Stain for Tubercle Bacilli.**—The solutions used by Klein are the following: 1. Three per cent. alcoholic solution of crystal violet. 2. One per cent. aqueous solution of ammonium carbonate. 3. Ten per cent. solution of nitric acid (C. P.) 4. Ninety-five per cent. alcohol. 5. Saturated alcoholic solution of Bismarck brown of which enough is added to water to make a tincture of iodin color. The tubercle bacilli stain a very pretty violet with a light brown, almost yellow, background.

New York State Journal of Medicine

January, XVI, No. 1, pp. 1-50

123 Cure of Syphilis. M. A. Reasoner, Washington, D. C.
124 Syphilitic Disease of Arteries. A. McPhedran, Toronto, Canada.
125 Gastro-Intestinal Manifestations in Syphilis. H. C. Buswell, Buffalo.
126 Nasopharyngeal Fibroma. W. S. Daly, Ogdensburg.
127 Some Methods Useful in Direct Laryngoscopy. C. J. Imperatori, New York.
128 Deaf Child from Standpoint of Educator. J. D. Wright, New York.
129 Blind Child. F. P. Lewis, Buffalo.
130 Implantation of Plates of Vulcanite and Cartilage in Nasal Septum. A. C. Howe, Brooklyn.
131 Mechanical Respiration Prior and Subsequent to July, 1887, Supplementary to Operation of Twenty-Eight Years Ago. G. E. Fell, Buffalo.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

January, XXII, No. 1, pp. 1-43

132 Chronic Intestinal Obstruction vs. Intestinal Stasis. F. W. Farham, New Orleans.
133 Experimental Study of Intraspinous Method of Therapy in Syphilis of Nervous System. F. M. Hanes, Richmond.
134 Improving Cancer Statistics in United States. C. E. Lakeman, New York.

Ophthalmology, Seattle

January, XII, No. 2, pp. 213-436

135 Relative Importance of Fitting of Glasses in Ophthalmic Practice. L. Emerson, New York.
136 Treatment of Asthenopia Dependent on Esophoria Relative to Near Work. E. H. Rowe, Baltimore.
137 Adaptation of Test Card to Its Double Function. E. Jackson, Denver.
138 Color and Moral Sense. G. H. Taylor, New South Wales.
139 Palpebral Syphilis; Report of Case. F. W. Alter, Toledo.
140 State Legislation Concerning Ophthalmia Neonatorum. F. Allport, Chicago.
141 Use of Iodin in Diseases of Eye. R. Kerry, Montreal, Canada.
142 Present Status of Tuberculin Therapy in Ocular Tuberculosis. W. B. Weidler, New York.

Pennsylvania Medical Journal, Athens

January, XIX, No. 4, pp. 231-314

143 *Management of Toxic Goiter. C. H. Frazier, Philadelphia.
144 Value of Heat in Treatment of Massive and Utterly Inoperable Uterine Carcinoma. J. F. Percy, Galesburg, Ill.
145 *Unappreciated Form of Pneumothorax. C. Rea, York.
146 *Therapeutic Pneumothorax. A. Armstrong, White Haven.
147 Electrocardiogram; Its Value as Aid in Diagnosis. J. D. Heard and A. P. D'Zmura, Pittsburgh.
148 *Treatment of Myocarditis. J. M. Anders, Philadelphia.
149 Diagnosis of Tubal Pregnancy: Study of Seventy-Five Consecutive Cases. A. Heineberg, Philadelphia.
150 *Treatment of Cancer by Use of Radium in Conjunction with Surgery. G. C. Boughton, Erie.
151 Classification of Diabetes Mellitus. A. I. Ringer, New York.
152 Treatment of Diabetes Mellitus with Special Reference to Allen's Method. A. Stengel, L. Jonas and J. H. Austin, Philadelphia.

143. Abstracted in The Journal, Oct. 16, 1915, p. 1399.

145, 146 and 150. Abstracted in The Journal, Oct. 23, 1915, pp. 1483 and 1484.

148. Abstracted in The Journal, Oct. 30, 1915, p. 1579.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

January 8, I, No. 2871, pp. 37-76

1 *Researches on Phagocytosis. H. J. Hamburger.
2 Absence of Proper Facilities for Treatment of Mental Disorders in Their Early Stages. B. Pierce.
3 Peripheral Shock and Its Central Effects. J. L. Thomas.
4 Castellani's "Tetravaccine" and "Pentavaccine." G. A. Lurie.
5 *Case of Severe Tetanus Successfully Treated by Antitoxin. T. P. Kilner.
6 Serologic Tests in Dysentery Convalescents. J. C. G. Ledingham and W. J. Penfold.
7 Metastatic Endophthalmitis in Case of Cerebrospinal Meningitis. A. L. Weakley.
8 Domiciliary Treatment of Pulmonary Tuberculosis. G. H. Dart.

1. **Researches on Phagocytosis.**—In examining systematically the influence of the addition of small amounts of various salts (ions) to the blood serum, Hamburger found that small quantities of calcium increased the phagocytosis to a considerable extent. An addition, for instance, of 0.005 per cent. of calcium chlorid ($CaCl_2$) to the natural medium (serum) caused an increase of about 22 per cent. in the phagocytic power. This favorable effect becomes even more strongly manifest when, instead of being added to the suspension of phagocytes in serum, the calcium is added to a suspension of phagocytes in a solution of sodium chlorid (common salt) in which phagocytosis occurs almost to the same extent as in serum. Iodoform solutions of different concentrations in a common salt solution of 0.9 per cent. were prepared and mixed with a thick suspension of white blood corpuscles. After having added carbon particles, the mixtures were left to themselves for half an hour in an incubator at 37 C., and then cooled down. Finally, microscopic preparations were made and examined to determine what percentage of the total numbers of white blood corpuscles had taken up carbon particles. In the pure salt solution, of the 388 examined leukocytes, 171 had taken up carbon, that is, 44 per cent. In the salt solution containing iodoform in a proportion 1 grain to 100,000 grains NaCl solution, the percentage was 59.2 per cent. Evidently the iodoform promoted phagocytosis.

Other substances soluble in fat, such as chloroform, chloral, alcohol, benzene, camphor, fatty acids (propionic and butyric), affect phagocytosis in a similar way. Chloroform 1 in 20,000 raises the phagocytosis power from 40.9 per cent. to 50.3 per cent.; further, phagocytosis is considerably increased by chloroform 1 in 100,000, in which case it rises to 60.5 per cent. Similar results were obtained with benzene, camphor, turpentine, alcohol, choral, fatty acids (propionic and butyric), and also Peruvian balsam. These all, without exception, promoted phagocytosis. Treatment with nitrogen causes an

increase of phagocytosis. In weak concentrations (for instance, 3½ volumes per cent. of CO_2 and less) phenol increases the phagocytosis, and in higher concentrations (for instance, 10 per cent.) it has a paralyzing effect. Potassium cyanid has the same effect on phagocytes, stimulating in slight doses, paralyzing in somewhat greater quantities.

5. **Tetanus Successfully Treated by Antitoxin.**—The points to which Kilner draws particular attention in this case are: (1) the recovery in spite of well-marked symptoms and a short incubation period (nine days); (2) the large doses of serum administered, 46,500 units in all; (3) the very slow and gradual relaxation of spasm.

Edinburgh Medical Journal

January, XVI, No. 1, pp. 1-88

9 Inversion of Ilium and Sacrum and Ischium and Pubes (Iliosacral and Ischiopubic Bony Segments) as Causes of Deformities of Female Pelvis. D. B. Hart.
10 Incidence of Tuberculosis. T. Shennan.
11 Hysterical Mastoiditis. J. S. Fraser.
12 Neuritis of Cochlear Division of Eighth Nerve Following Exposure to Cold. J. S. Fraser.
13 Fatty Tumor of Hypopharynx Obstructing Larynx. J. S. Fraser.
14 Case of Cleidocranial Dysostosis. D. M. Greig.
15 Case of So-Called Tetanism. J. S. Fowler.

Indian Medical Gazetta, Calcutta

December, 1915, L, No. 12, pp. 441-480

16 Analysis of Snake-Bite Cases Reported in Central Provinces. G. W. P. Dennys.
17 Injuries to Eye Resulting from Accidents at Polo. A. E. J. Lister.
18 Coolie Anemia. C. E. P. Forsyth.
19 *Treatment of Kala-Azar with Intravenous Injection of Metallic Antimony. R. U. N. B. Bahadur.
20 Clinical Observations on Kala-Azar. P. Murugesan.
21 Case of Primary Atheroma of Pulmonary Artery and Its Branches Contributing to Valvular Insufficiency of Heart. T. S. Tirumurti.
22 New Cataract Operation. M. Corry.

19. **Kala-Azar Treated with Injection of Metallic Antimony.**—Bahadur claims originality for the use of antimony in kala-azar. One grain of metallic antimony is made into a thoroughly homogeneous paste with sufficient liquid glucose in a glass mortar and then mixed with 20 c.c. normal saline. This is injected into the vein. Any sediment of antimony left inside the syringe is subsequently mixed with normal saline containing 5 per cent. glucose, and then injected into the vein. This process is repeated several times till no antimony is left inside the syringe. About 40 to 45 c.c. of normal saline is required to inject 1 to 1½ grains of metallic antimony. So far the results are encouraging. No untoward results, such as plugging of the capillaries, have followed the intravenous injection of metallic antimony. Sometimes the patient suffered from rather severe diarrhea, which, however, stopped in twenty-four to forty-eight hours.

Journal of Tropical Medicine and Hygiene, London

January 1, XIX, No. 1, pp. 1-16

23 Streptococcal Puerperal Fever in Anglo-Egyptian Sudan. A. J. Chalmers and S. Atiyah.

Lancet, London

January 8, I, No. 4819, pp. 61-116

24 Medicine, Magic and Religion. W. H. R. Rivers.
25 *Study of Shell Rock. C. S. Myers.
26 Advantages of Warm Anesthetic Vapors and an Apparatus for Their Administration. F. E. Shipway.
27 Flora of Wounds and Flora of Putrefaction. A. Distaso.
28 *Simpson Light. W. D. Harmer and E. P. Cumberbatch.
29 Hyperthyroidism as Cause of Irritable Heart of Soldiers. C. P. White and F. Hernaman-Johnson.
30 Case of Shrapnel Injury to Right Parietal Cortex. H. M. Anderson and H. L. C. Noel.
31 Traumatic Dislocation of Hip-Joint in Child. H. Platt and H. M. von Mengershausen.
32 Sanitation in Billets and Camps. A. White.

25. **Study of Shell Shock.**—A selected few of various cases of "shell shock" which he has had the opportunity of treating in the field by means of hypnosis are cited by Myers. The cases are: total amnesia; rhythmic spasmodic movements; mutism and stupor. Myers has hypnotized, or attempted to hypnotize, twenty-three men with shell shock. The conditions under which he worked were such that no patient was subjected to further hypnotic treatment unless he proved readily hypnotizable on the first trial. The immediate results may be summarized as follows: 1. Apparently complete cures, 26 per cent. 2. Distinct improvement, 26 per cent. 3. Failure to hypnotize, 35 per cent. 4. No improvement after hypnosis, 13 per cent.

28. **Simpson Light.**—The Simpson light is emitted from an electric arc formed between electrodes made by a special process from a mixture of the ores of certain metals, the chief one being a tungstate of iron and manganese, known as wolfram. The Simpson light is made up of rays of two kinds: 1. Visible rays: These are the visible rays of the luminous spectrum, violet, blue, green, etc., down to red; these rays together produce white light. 2. Invisible rays: These are heat rays and ultraviolet rays. It is to the latter that the therapeutic properties of the light are said to be due. At St. Bartholomew's Hospital a number of cases with various types of disease have been treated: rodent ulcer; lupus; syphilis; asthma; vasomotor rhinitis; nasal catarrh and sinusitis; otosclerosis and eczema. The Simpson light seems to stimulate the healing of wounds. Cases of shrapnel wound have been benefited. When disease affects the deep parts or subcutaneous parts there is usually no benefit.

Bulletin de l'Académie de Médecine, Paris

Dec. 28, 1915, LXXIV, No. 52, pp. 795-822

33 *The Absolutely Aseptic Operating Room. (La salle aseptique pour opérations est-elle réalisable? Etude technique.) H. G. Richter and R. Blanchard.
34 *Motor Localizations in Peripheral Nerves. P. Marie, H. Meige and A. Gosset.
35 *The Bradycardia of Fatigue. A. Gouget.
36 Retraction of Paralyzed Muscles after Wounds of Nerves. L. Lortat-Jacob and A. Sézary.
37 Geometrical Formula to Locate Metal Foreign Bodies with the Roentgen Rays. (Nouveau procédé de repérage radioscopique des projectiles.) A. Charlier.
38 *Direct Oxygen Treatment of Tuberculous Fistulas and Abscesses. (De l'action des injections d'oxygène dans le traitement des tuberculoses chirurgicales en hyperhémie.) Gendron and Bouchet.

33. **The Aseptic Operating Room.**—Richter is an architect who has designed an operating room which can be kept aseptic. It is to be ventilated exclusively with sterilized air. The spectators stay in an adjoining room with glass front which is only 2.5 meters from the operating table. The surgeon's words are transmitted by a telephone and megaphone to the spectators. There is a protecting zone around the operating room; in this the sterilizing service is installed. This in turn is protected by an outer zone which contains the anesthetic room and the surgeons' and nurses' toilets. The doors when closed present an absolutely smooth surface continuous with the inner wall.

34. **Localization of Motor Functioning in Peripheral Nerves.**—Marie and his co-workers have been continuing their research with direct electric stimuli applied to a wounded trunk nerve exposed at an operation. By this means they have studied the distribution of the fibers destined for the different muscles tributary to this nerve. In 21 of the 64 cases the electricity failed to elicit any response in the connected muscles, the severe wound having interrupted all conducting power in the nerve. In the 43 other cases, all the groups of muscles responded in turn as the trunk fibers were stimulated, or only certain muscles, according to the extent of the injury. The fibers were tested with a needle electrode and no apparent harm resulted in any way. The trunk nerve twists naturally more or less in its course, and the gunshot or shell wound may further alter its position, as also the efforts to expose it. The nerve should be exposed for 6 or 8 cm. and two glass rods should be worked beneath it. The electrodes are then applied to the portion of the nerve between the glass rods. One assistant should control the motor reactions and another should have charge of the regulation of the electric—faradic—current, commencing with a very weak current or interposing a rheostat. Stimulation of the antero-external fibers in the median nerve in the forearm,

for example, causes contraction in the muscles of pronation of the arm. The findings in each of the principal trunk nerves are described in detail, and the necessity for exact coaptation of the fibers in operating is emphasized.

35. **Fatigue Bradycardia.**—After excluding all other possible causes for the pulse between 40 and 60 noted in 44 out of 133 apyretic men in the hospital, Gouget explains it by extreme fatigue, loss of sleep and emotional stress. Its transient nature and the prompt influence of change of position or of amyl nitrite confirm its nervous origin. The blood pressure was usually normal or a little below.

38. **Oxygen in Treatment of Tuberculous Processes.**—Gendron and Bouchet refer only to tuberculous fistulas and abscesses and state that these show no benefit from the oxygen unless the tuberculous process has an active circulation of blood through it. The first step therefore is to insure this active local circulation of blood, either by superheated air, revulsion from cold water, rubbing or other means. The abscess is then cleaned out and oxygen is introduced directly into the abscess, through a two-way tube, under very slight pressure, and with constant manometer control. In thirty-seven abscesses and nineteen fistulas thus treated, no surgical measures were required. No abscess thus treated entailed a fistula. There are no drugs to be absorbed, while the healing proceeded exceptionally fast, they report, under the hyperemia and the oxygen.

Paris Médical

January 1, VI, No. 1, pp. 1-40

39 Psychoses from Emotional Shock or Shaking up of the Nervous System. (Les psychoses commotionnelles.) G. Ballet and J. R. de Fursac.
40 *Psychiatry in the Active Army. P. Chavigny.
41 *A Service for Treatment of Nervous and Mental Disease among the Troops. (Un centre de neurologie et de psychiatrie d'armée.) G. Roussy and J. Boisseau.
42 *Hemianopsia from Wounds of Occipital Lobe. (L'hémianopsie bilatérale homonyme en quadrant seul reliquat de blessures graves du lobe occipital.) M. Villaret and A. Rives.
43 Posttraumatic Contractures and Their Treatment. A. Léri and E. Roger.
44 *Radiotherapy in Spastic Affections of the Spinal Cord from Wounds in War. G. Bonnus.

40. **Psychiatry at the Front.**—Chavigny emphasizes that the earlier the nervous and psychic disturbances get proper treatment the better the result. He also insists on the importance of treating the psychic and nervous disturbances at the same time as any physical lesion which may need treatment. For instance, digestive derangement should be treated at the same time as hysteric paralysis, when both are noted in a patient. Progressive reeducation is the key to effectual treatment of paralysis and motor and hysteriform sensory disturbances, but such patients generally expect and do better when given some medicine to take, such as a potion containing eucalyptol. The faradic current is always an effectual means to reeducate the sensibility when applied properly, as he describes. With the cure of the anesthesia the paralysis and hyperesthesia in the limb subside too. The mental disturbance after explosions proved rapidly curable in 95 per cent. of the cases. The cure occurred sooner and was more complete when the men were kept in the general hospital, without attempt at isolation, but kept quietly in bed, with a purge if there was constipation or diarrhea, and tepid or cold douches. The cure seemed to be hastened by a mild emotional shock, such as asking the man to write or dictate a letter to his family.

41. **Neurology Near the Firing Line.**—An illustrated description is given of a hospital for nervous and mental affections which has been at work now for five months near the clearing station. Fully 34 per cent. of the men were back in the trenches in two or three weeks. Those with merely functional disturbance were thus saved from getting into ruts. This central service for neurology and psychiatry also permitted the detection at once of organic troubles requiring specialist measures.

42. **Hemianopsia from Wound of the Occipital Lobe.**—Villaret and Rives have recently encountered six cases in which a wound in the occipital lobe had entailed as the only disturbance in vision a homonymous bilateral hemianopsia. Systematic examination for hemianopsia will certainly modify the estimation of the outcome and of future earning capacity, in cases of injury of the skull when possibly nothing else would suggest that the nervous centers had been irreparably injured.

44. **Radiotherapy of Spastic Affections of the Spinal Cord After Gunshot or Shell Wound.**—Bonnus reports here eleven cases. The best results were realized in spastic hemiplegia from injury of the cord in the neck, but some benefit was realized in nearly every case. The interval since the injury ranged from two to ten or eleven months, and the spastic phenomena had shown no signs of retrogression for many weeks. The benefit was apparent even after the first sitting. As the spastic phenomena subsided, the pain from the inflammation of the roots also became less or ceased entirely. The exposures were usually made once a week, to a total of six to nine. The dose was 1 or 1.5 H at the point of the lesion.

Revue de Chirurgie, Paris

August, 1914—November, 1915, XXXIV, Nos. 8-9, pp. 137-432. Last indexed Aug. 22, 1914, p. 711

45 *Circumscribed Nutritional Disturbance in Long Bones Simulating a Tumor. (Les dystrophies osseuses — kystes simples, cals soufflés, ostéite fibro-kystique — simulant les tumeurs des os.) L. Bérard and H. Alamartine.
46 Coxa Valga. G. Worms and A. Hamant. To be continued.
47 Treatment of Abdominal Wounds in War. (Du traitement des plaies de l'abdomen par projectiles de guerre.) E. Quénu.
48 The Principles for Treatment of Fractures. P. Delbet.
49 Treatment of Septic Wounds. (Essai de réhabilitation des antiseptiques.) L. Bérard and A. Lumière.
50 The Varying Shape of the Stomach According to the Site of Lesions in it. (Les caractères morphologiques de l'estomac d'après le siège des lésions.) X. Delore and H. Fayol.
51 Fractures of the Astragalus. (Etude des fractures de l'astragale: les fractures vertico-transversales du col et du corps.) R. Baudet.
52 Diagnostic Importance of Emphysema of the Scrotum. (L'emphysème scrotal signe de plaie colique rétro-péritonéale.) A. Chalier.

45. **Pseudotumors in Long Bones.**—Bérard and Alamartine devote fifty pages, with illustrations, to the study of localized dystrophy of the long bones. The resulting simple cyst or fibrocystic osteitis or puffed up callus simulates most deceptively a true tumor of the bone. Differentiation is extremely important, as these lesions are not at all malignant and never recur when the cyst has been emptied or other conservative operation has been done. The whole trouble is merely some interference with the nourishment of the bone at that point. Insufficiency of the ductless glands which regulate the nutrition of bone tissue—the thyroid, in particular—seems to be a factor in some instances. The trouble generally dates from childhood, and in 80 per cent. there was a history of traumatism, but Bérard and Alamartine think that the bone was already affected at the time of the traumatism, in a certain proportion of the cases at least. The regular location of the dystrophy close to the epiphysis and the integrity of the latter are special features of the fibrocystic type of osteodystrophy. When the trouble is in the shaft of the bone there is generally a solitary cyst. When the epiphysis is invaded the lesion is of the type known as exuberant callus, *cal soufflé*. This latter type occurs only in adults, the protecting epiphyseal cartilage having disappeared. The dystrophy is always a solitary lesion. When first seen by the physician there may be what seems to be a malignant tumor, or spontaneous fracture, or vicious consolidation of a fracture with exuberant callus. The pseudotumor is generally found in order of frequency at the upper end of the humerus or femur or at either end of the tibia. When in the shaft itself, the tibia is usually the bone involved. There is no reaction in the soft parts, and the joint is almost invariably intact. The lesion remains stationary a long time, not giving trouble until it is injured in some contusion. Then it begins to enlarge and the bone shell may fracture, with resulting inability to use the limb. Blundering assumption of a tumor may lead to entirely unnecessary mutilating operations. Tumors in the long bones, particularly in the young, run a much more rapid course, but roentgenoscopy is the main reliance in differentiation, as the shadow of the cystic lesion of the bone is unmistakable, the round or fusiform light

space with the linear shadow outlining it and the periosteum not thickened anywhere. The only other bone affection that might be confused with it is echinococcus disease, but with this there are multiple light spots and the joint is usually involved.

Berliner klinische Wochenschrift

Dec. 27, 1915, No. 52, pp. 1321-1336

53 *Diagnosis of Perforation with Abdominal Wounds. (Ueber Bauchschüsse im Felde.) Kausch.
54 *Cancer of the Orbit. (Mit Erhaltung des Augapfels operiertes aprikosengrosses Fibrosarkom der Augenhöhle.) Halben.
55 *Petroleum Ether in Bacteriologic Examination of Stools. (Untersuchungen über die Bedeutung des Petroläthers für den Nachweis von Typhus- und Paratyphusbakterien im Stuhl.) H. C. Hall.
56 Foreign Pharmaceuticals. (Wie sollen wir uns in Zukunft zur pharmazeutischen Produktion des feindlichen Auslandes stellen?) A. Lewy.

53. **Diagnosis of Extent of Injury in Cases of Abdominal Wounds.**—Kausch has found that it is possible to determine whether or not the intestines or other viscera have been injured, by the discovery of free air in the abdominal cavity. This is an almost certain sign of perforation, according to his experience, which has been wide and varied. The army corps to which he is consulting surgeon has served in turn in Belgium and France, Alsace, Galicia, Russian Poland and Serbia. A very small incision will reveal whether there is free air in the abdominal cavity. He makes the exploratory buttonhole for the purpose in the epigastrium under local or general anesthesia. The thicker the abdominal wall, the longer the incision, from 1 to 3 cm. The peritoneum need be only punctured; a pinhead hole is enough. If air streams out, he proceeds at once to a regular laparotomy. If not, the patient is spared a major operation for the time being at least. He has had cases in which a bullet passed through the abdomen, front and rear, without perforating the gastro-intestinal tract. When there was perforation, death was inevitable without operative relief, and he is convinced that his prompt operating saved a certain proportion of such cases. No one was ever harmed by the operation after an abdominal wound. Kausch was kept informed by telephone where fighting was under way, so that he was on the spot, ready to operate, before the wounded began to come in.

54. **Cancer Removed from Orbit without Destruction of Eyeball.**—Halben gives an illustrated description of a case in which he removed a fibrosarcoma, 3.5 by 4 cm. in size, from the orbit. The growth was easily shelled out and the eyeball replaced. Vision has improved since until the man can count fingers at 25 cm. This is the second case in which Halben has operated in this way, but in the other case vision had long been lost in the eye involved.

55. **Benzin in Bacteriologic Examination of Stools.**—This is practically the same article as the one summarized in THE JOURNAL, Jan. 22, 1916, p. 317. The abstract contains an error corrected later, page 466, as petroleum ether (not ordinary ether, as stated in the abstract), is meant. Tables are given which show the remarkable way in which the hydrocarbons of the paraffin series inhibit the growth of the colon bacillus while permitting typhoid bacilli to proliferate unchecked. As already stated, this effect is the more pronounced the lower the boiling point of the petroleum distillates in question. With benzin (boiling point, 80 or 90 C.), there is still some growth of colon bacilli, but with petroleum ether with a boiling point below 50 C. there is scarcely a trace of growth, and with the distillate known as pentan (boiling point 38 C.), the colon bacilli show no traces of growth while typhoid bacilli proliferate luxuriantly.

Correspondenz-Blatt für Schweizer Aerzte, Basel

Dec. 25, 1915, XLV, No. 52, pp. 1633-1664

57 Professor Theodor Langhans. C. Wegelin.
58 Roentgen Treatment of Uterine Cancer. (Zur Behandlung des Uteruskarzinoms durch Röngenstrahlen.) H. Guggisberg and M. Steiger.
59 *Pellagra in Switzerland. (Ueber den pellagrösen Symptomenkomplex bei Alkoholikern in der Schweiz.) J. Jadassohn.

59. **Pellagra in Switzerland.**—It has been generally accepted that pellagra is unknown in Switzerland and Germany, but Jadassohn has encountered four cases at Bern in which three women and one man presented it, and Bloch has reported a case of pellagra at Basel in a strict vegetarian. The first symptoms in Jadassohn's cases had been the changes in the skin; diarrhea and stomatitis followed, and later the nervous and mental disturbances. He does not attempt to decide how much of the psychosis was due to the pellagra and how much to alcoholism; all four were addicted to liquor. One patient was the wife of a teacher and necropsy disclosed heart disease as the direct cause of death. The other patients recovered under dieting, astringents and opium for the diarrhea and salves for the hands. The follicular hyperkeratosis in the face subsided spontaneously. The article is to be continued.

Deutsche medizinische Wochenschrift, Berlin

Dec. 16, 1915, XLI, No. 51, pp. 1505-1536

60 Advantages of Early Operative Treatment of Wounds. (Ueber Wundbehandlung im Kriege.) O. Zuckerkandl.
61 Functional Nervous Disturbances in the Wounded. (Funktionelle Nervenstörungen bei Kriegsteilnehmern, nebst Bemerkungen zur traumatischen Neurose.) E. Meyer.
62 Functional Systolic Heart Murmurs. (Ueber systolische funktionelle Herzgeräusche.) G. Treupel.
63 *Experiences with Malignant Phlegmons. v. Tappeiner.
64 Plaster Cast for Fracture of Upper Arm. (Der Gipsverband bei Oberarmfrakturen.) M. Anker and E. Mosse.
65 *Pylorospasm Yields to Large Doses of Atropin. (Atropin bei Pylorospasmus.) K. Ochsenius.
66 Radiotherapy of Gonorrheal Epididymitis. (Behandlung der Epididymitis gonorrhoica mit der Nitra-Therapielampe.) H. L. Heusner.

December 23, No. 52, pp. 1537-1564

67 *Pituitary Treatment of Exophthalmic Goiter and Hyperthyroidism. (Ueber die Wirkung des Hypophysenextrakts bei Thyreosen.) J. Pal.
68 *Mechanical Cause of Sciatica and Flatiron Treatment. (Zur Aetiologie und Therapie der Ischias.) J. Csiky (Budapest).
69 The Physiologic Bases for Coagulation of Blood and Means to Arrest Hemorrhage. (Ueber die physiologischen Grundlagen der Blutstillung und über ein neues Blutstillungsmittel: Thrombosin). L. Hirschfeld and R. Klinger (Zurich).
70 Economical Technic for Bacteriologic Research. (Wiederholte Benutzung von Bakteriennährböden und Ersatz von Fleischextrakt durch Pflanzenextrakte. Die Verwertbarkeit der konservierten Nährböden für den Feldgebrauch — nach Uhlenhuth und Messerschmidt.) F. Guth.
71 Present Status of War Surgery. (Ergebnisse der bisherigen kriegschirurgischen Erfahrungen.) H. Matti. Commenced in No. 49.
72 Present Status of War Internal Medicine. (Ergebnisse der bisherigen Kriegserfahrungen auf dem Gebiete der inneren Medizin.) Reckzeh. Commenced in No. 49 and continued.
73 Field Treatment of Suppurative Processes on the Legs. (Zur Behandlung der Pyodermatosen der unteren Extremitäten im Felde.) M. Strauss.
74 Treatment of Wounds with Warm Baths and Ultraviolet Rays. V. Hufnagel, Jr.

63. **Malignant Phlegmons.**—Tappeiner relates that the phlegmon with early livid discoloration of the skin is even more malignant than the gas phlegmon. Both are the work of anaerobic germs and hence prophylaxis requires ample opening up of wounds and "open" treatment. He has seen both forms develop when the man was wounded at several points.

65. **Atropin for Pylorospasm.**—Ochsenius remarks that the experiences in Czerny's pediatric clinic have demonstrated that children can bear much larger doses of atropin than was formerly supposed possible. This heralds a new era in treatment of pylorospasm, for doses of from one to three drops of a 0.01 : 10.0 solution of atropin three or four times a day are proving effectual in curing pylorospasm. If it does not relieve, we can confidently assume that there is congenital stenosis of the pylorus. Two cases are described in detail showing the prompt curative action of the atropin. He repeated the three-drop dose five or six times during the day, thus giving a total of 0.75 or 0.9 mg. of atropin. To avoid dilatation of the vessels in the skin by the atropin, he gave one-drop doses, before feeding, increasing to three drops, and keeping this up for two or three weeks and then reducing it. The first child was a month old and was in collapse when the large doses of atropin were started, after failure of other measures during three weeks of treatment. The vomiting stopped at once and the weight increased by an average of 21 gm. a day for five weeks. The atropin was

kept up intermittently for nearly ten weeks, and the child came out finally well and strong although gastritis had also to be contended with. The other child developed the pylorospasm when three weeks old and by a mistake it was given eight feedings in the twenty-four hours with atropin each time. This brought the daily dose of atropin to eight times 0.15 mg., a total of 1.2 mg., which it bore for a week without the slightest harm. The maximal daily dose for an adult is said to be 3 mg. Both infants were breast-fed.

68. **Pituitary Treatment of Excessive Functioning of the Thyroid.**—Pal's attention was called to this line of research by the antagonistic action on the arteries of pituitary extract and thyroid extract. He found that subcutaneous injection of an extract of the infundibulum part of the hypophysis cerebri had apparently no influence on the normal thyroid and on ordinary goiter. But it displayed a pronounced action on the thyroid when functioning to excess, as in exophthalmic goiter. The symptoms subside although the thyroid may increase in size under its influence. This increase was always in the vesicles alone, suggesting that the secretion in the vesicles and the production of thyrotoxin are separate processes. The article is based on sixteen cases of exophthalmic goiter and hyperthyroidism. In three cases the debility was so extreme that operative measures could not be considered, but the patients improved so much under the pituitary treatment that they were then successfully operated on. Another case demonstrates, he states, that pituitary treatment is able to arrest destructive retrogression in the excessively secreting thyroid. In this and another case related the thyroid trouble was evidently brought on by the therapeutic use of iodin. It had been given in the last mentioned case for arteriosclerosis in a man of 44, and had entailed symptoms of exophthalmic goiter. They improved under pituitary treatment, but vascular spasms developed. The treatment was stopped, but local gangrene and death from myocarditis soon followed. This case warns for special care in pituitary treatment of weak heart with arteriosclerosis. In fact, great caution must be constantly observed with pituitary treatment as the individual response to the dosage varies within extremely wide limits.

68. **Nature and Treatment of Sciatica.**—Csiky shows by the anatomic relations of the parts that a very important factor in development of sciatica is the compression of the nerve against the tuberosity of the ischium by asymmetrical sitting on a hard seat. Few persons sit squarely and symmetrically, but this is the only way to avoid squeezing the nerve against the bone. The constant irritation from this may set up finally a neuritis in the sciatic nerve. Prevention and treatment call for a symmetrical position and a cushioned seat. After failure of other measures, he has often succeeded in curing sciatica by applying heat with a flatiron, holding it against the nerve as the patient lies on his sound side, the knee drawn up. Warm covers are kept on the leg above and below and the flatiron is held against the nerve for half a minute to a minute at each point and then moved along, the aim being to heat the tissues thoroughly and deep and keep the heat in. The affected portion of the nerve is near the buttocks region, and it is not necessary to apply the heat much lower down. A ten minute sitting once a day is enough, and better results are obtained by commencing with mild heat.

Medizinische Klinik, Berlin

Nov. 28, 1915, XI, No. 48, pp. 1307-1336

75 *Experimental Demonstration of Efficacy of Vaccination against Typhoid and Cholera. (Experimentelle Untersuchungen über die Wirksamkeit der Typhus- und Choleraschutzimpfung.) A. v. Wassermann and P. Sommerfeld.

76 Serologic Tests for Typhus. (Ueber Serumreaktionen bei Fleckfieber.) E. Gotschlich, W. Schürmann and Bloch.

77 War Epidemics in 1913 Balkan Campaign. (Einige Beobachtungen über Kriegsseuchen im Balkankriege 1913.) A. Böhme.

78 *Surgical Experiences with Jacketed Bullets. (Kriegschirurgische Erfahrungen mit den Mantelgeschossen.) J. Bogdanik.

79 *Bacteriologic Experiences with War Diseases. (Bakteriologische Erfahrungen über Kriegsseuchen.) H. Aronson. Concluded.

80 Petrolatum Treatment of Large Wound Cavities. (Zur Behandlung grosser Wundhöhlen.) H. Martin.

81 Charcoal as Aid in Cultivation of Typhoid Bacilli. (Die Verwendung der Tierkohle zum Nachweis von Typhusbacillen.) P. Kuhn.

82 *Familial Nature of Jaundice in the Newly Born. (Zur Klinik des Ikterus neonatorum.) H. Abels.

December 19, No. 51, pp. 1391-1416

83 Hypnosis in Treatment of War Hysteria. (Zur therapeutischen Verwendung der Hypnose bei Fällen von Kriegshysterie.) M. Nonne. Concluded in No. 52.

84 *War Maladies in the Civilian Population. (Ueber Kriegskrankheiten der Zivilbevölkerung.) I. Boas.

85 Paratyphoid B in Six Months' Infant. E. Mayerhofer.

86 Rubber Bulb for Pipetting in Laboratory Work. (Zur Verhütung von Laboratoriumsinfektionen.) L. Paneth.

87 *Vertebral Affections in Convalescence from Typhoid. (Wirbelerkrankungen in der Typhusrekonvaleszenz.) E. Lyon.

88 Possible Danger of Photodynamic Disturbances from Eosin Staining of Fodder. (Zur Eosinfärbung der Futtergerste.) F. Schanz and E. Rost.

75. **Experimental Testimony to the Efficacy of Vaccination Against Typhoid and Cholera.**—Wassermann and Sommerfeld recall that injection of killed typhoid or cholera germs causes an accumulation of specific immune substances in the blood which are able to kill the corresponding typhoid or cholera germs. Healthy blood already possesses bactericidal properties, and the vaccination merely enhances this normal property. Living typhoid or cholera germs can be injected under the skin and even into the blood, but infection does not result unless the germs reach and pass through the epithelium of the intestines. The question of the efficacy of vaccination depends on whether the lining of the intestines is rendered thereby less permeable for the germs. To decide this by animal experimentation is difficult, as monkeys alone are susceptible to typhoid and cholera germs by the mouth. Laboratory animals are absolutely refractory as a rule, especially mice. Even when three loops of a highly virulent culture of typhoid bacilli are introduced directly into the stomach of a mouse, none of the hundreds of millions of the germs seem able to get a foothold in the abdominal wall, although virulent bacilli can be recovered from the intestines up to twenty-four hours later. These facts are the more remarkable because paratyphoid bacilli pass readily through the bowel wall and set up a fatal disease. Mouse blood is strongly bactericidal for typhoid and cholera bacilli, as is shown by the rapid disappearance of these germs when large amounts are injected subcutaneously.

It seems plausible to assume that there is a direct connection between the powerful bactericidal property of the blood and the lack of permeability on the part of the bowel lining. This assumption is sustained by the fact that when the bactericidal property of the mouse blood is reduced by various means, the typhoid and cholera bacilli are able to get a foothold in the intestinal epithelium and soon pass through it and induce fatal typhoid or cholera, as the case may be. There are various ways of reducing the bactericidal property of the blood. One means is by a second infection. Wassermann reported years ago that a simultaneous second infection was almost certain to reduce the resisting power so low that the animal yielded to the first infection to which, under natural conditions, it was immune. Likewise, a sterile extract of killed typhoid or paratyphoid bacilli injected subcutaneously binds and uses up the natural protecting substances in the blood. This leaves the blood defenseless, and the animal is thus susceptible to infection to which it naturally is immune. This defenseless condition, however, is only a transient phase, the healthy organism promptly replenishing its store of immune substances unless depressed by being underfed.

In the experimental research related the mice were kept without food for a day or two. Then they were given a subcutaneous injection of 0.5 c.c. of a sterile aqueous extract of typhoid bacilli (artificial aggressins). By this means the bactericidal power of the blood was sensibly reduced. Then a loop of living typhoid bacilli in a bouillon suspension was introduced directly into the stomach, and no food given thereafter. The mice were killed in from twenty to forty-eight hours, and the bacilli were refound in the heart, spleen and liver in six of the thirteen animals and in none of the controls. Similar experiments with cholera germs gave analogous results. All testify that the bactericidal power of the blood is directly connected with the susceptibility of the

bowel tissue to invasion by typhoid and cholera bacilli. As prophylactic vaccination of man against these diseases materially enhances the bactericidal power of the blood against the causal germs, we hence have reason to assume that the prophylactic vaccination also reduces the susceptibility to these germs. This reduced susceptibility, however, is liable to fluctuate under the influence of undernourishment, secondary infections, etc. It is not a stable protection like that afforded by vaccination against smallpox. These facts emphasize that proper nourishment, avoidance of secondary infections and general hygiene are factors of the utmost importance in warding off typhoid and cholera, after vaccination as well as under other conditions. Any increase in the prevalence of other infections must bring with it an increase in the incidence of typhoid, in spite of the antityphoid vaccinations. But the experimental research reported confirms anew the great value of the protection afforded by antityphoid and anticholera vaccination.

78-79.—These two articles are listed in the table of contents of our exchange and the first is said to be accompanied by twenty-four illustrations. The seven pages containing these articles had been cut out.

82. **Familial Character of Jaundice in the Newly Born.**—Abels calls attention to two laws which he has discovered in icterus neonatorum; firstly, that it occurs in all the children of a family if it develops at all, and, secondarily, that its intensity decreases regularly from the first child downward. This suggests that both maternal and fetal factors cooperate in it.

84. **The War and the Health of the Civilian Population.**—Another article by Boas on this subject is reviewed below, abstract 105. He says that gastro-intestinal disturbance seems to be no more prevalent during the war than at other times, which demonstrates that the "war bread" has not done harm. On the whole, he declares. the simpler and thriftier mode of life consequent on the war seems to have raised the level of the general health, and he thinks the populace will profit by this lesson after the war is over. He has not found nervous dyspepsia or diabetes more frequent than in ordinary times. Gallstone trouble is encountered with special frequency in the wives of soldiers, and it is more prevalent in men than usual. He recently had a gallstone case in a youth of 16. Cancer of the digestive organs is becoming surprisingly frequent in his practice. Scarcely a week passes without his encountering two or three new cases, and he has been impressed with the youth of the patients; in some recent cases the cancer was in the rectum, liver or stomach in young women of 21, 24 and 27 years, respectively. Whether this is an actual increase in cancer can be determined only when the general mortality statistics for the period are known.

87. **Typhoid Vertebral Trouble.**—Lyon writes from the military convalescent home at Spa, Belgium, to describe seven cases of an inflammatory process in vertebrae during convalescence from typhoid. In only two cases was it severe, with intense pains and swelling of the soft parts and fever. The vertebral affection persisted for two, three, or four months in all, long latent phases alternating with exacerbations. There was very little tendency to suppuration, and the prognosis was favorable, with final complete recovery. He warns that pains in the back during convalescence call for careful examination of the vertebrae. Even mild posttyphoid vertebral affections may be accompanied with great pain, but permanent recovery is the rule.

Münchener medizinische Wochenschrift, Munich

Dec. 21, 1915, LXII, No. 51, pp. 1745-1780

89 Impairment of Earning Capacity from Nervous Consequences of Accidents. (Zur Begutachtung nervöser Unfallfolgen.) P. Horn.
90 Asthma Need Not Materially Impair Fitness for Military Service. (Asthma und Felddienstfähigkeit.) M. Saenger.
91 Agglutination of Gärtner's Bacilli along with Typhoid Bacilli an Aid in Diagnosis of Typhoid. (Die Mitagglutination der Gärtnerbazillen, ein Hilfsmittel zur Typhusdiagnose.) G. Seiffert.
92 *Peritonitis with Gas Production in Free Abdominal Cavity. (Zur Symptomatologie und Therapie der Pneumoperitonitis.) H. Doerfler.
93 *Vaccination against Typhoid Rouses Old Latent Disease. (Fall von tertiärer Lues nach Typhusschutzimpfung.) K. Bardach.
94 *Technic for Healing by Primary Intention after High Amputation of the Rectum. A. Schäfer.
95 Treatment of Beginning Intestinal Disease. (Behandlung beginnender Darmkrankheiten im Felde.) Neubauer.
96 Mild Cases and Bacteriology of Dysentery. (Erfahrungen über leichte Ruhrfälle.) C. Kittsteiner; (Zur Bakteriologie der Ruhr im Kriege.) E. Seligmann and L. Cossmann.
97 Paratyphoid A among the Troops; Forty-Eight Cases. (Paratyphus-A Erkrankungen im Felde.) Klinger.
98 Plastic Tendon Operations and other Measures for After-Treatment of Wounds in War. (Nachbehandlung von Kriegsverletzungen.) G. Fischer.
99 Notes of an Ophthalmologist at the Front. (Augenärztliche Beobachtungen aus einem Notreservespital der südwestlichen Front.) A. Löwenstein.
100 Bridge Plaster Casts. (Zur Technik der Gipsbrückenverbände.) H. F. O. Haberland.
101 Plaster Casts for Fractured Upper Arm. (Neue einfache Gipsverbandtechnik bei Behandlung der Oberarmschaftbrüche in Semiflexionsstellung.) L. Oelsner.
102 Clamp for Small Vessels. (Der Angiokompressor — Gefässquetscher.) O. v. Herff.
103 Tendon Transplantation Corrects Paralysis from Wound in Lumbar Plexus. O. Orth.

92. **Pneumoperitonitis.**—Doerfler reports a case of subacute peritonitis in which the bowels moved but the distension of the abdomen was not reduced by the passage of flatus. The distension was so extreme that it impeded the movements of the diaphragm, but the general condition and the pulse kept good for three weeks and there was no vomiting. The gas was released by repeated punctures but this did not remove the cause, and finally the patient succumbed with the ordinary symptoms of septic peritonitis. Necropsy revealed an encapsulated focus of peritonitis in the upper abdomen which might easily have been cleared out if it had been discovered in time. The peritonitis was traced to the stump of the mesentery which had been resected in the course of an operation for scrotal hernia. The catgut may have been contaminated.

93. **Tertiary Syphilis after Antityphoid Vaccination.**—In Bardach's case a supposedly entirely healthy man of 40 with healthy children noticed swelling and redness in the left chest soon after vaccination against typhoid. The trouble proved refractory to salves and similar measures but yielded at once to treatment for syphilis. The man had never suspected that he had syphilis, but the vaccination had evidently roused an old, always latent syphilis to tertiary manifestations. The Wassermann proved positive also, and a minute scar was found on the penis which had been there for twenty years but had been ascribed to a saddle bruise at the time.

94. **High Amputation of the Rectum.**—Schäfer draws the proximal stump out through the wound, letting it hang down for 8 or 10 cm. below the wound which, with the whole buttocks, are carefully protected by a cover of adhesive plaster, etc. The patient lies on his side and the stump hangs in a suspended urinal. In four of the five cases thus treated the wound healed by primary intention. The projecting stump shrivels and conditions for a good sacral anus are thus provided.

Therapie der Gegenwart, Berlin

December, 1915, LVI, No. 12, pp. 441-480

104 *Serotherapy and Anaphylaxis from Standpoint of General Practitioner. (Bedeutung der Anaphylaxie für den praktischen Arzt.) U. Friedemann.
105 *Management of Gallstone Cases. (Meine Erfahrungen über die Behandlung der Cholelithiasis.) I. Boas.
106 Recent Experiences with Cholera at Budapest; Eighty-Nine Cases. (Erfahrungen über die Cholera asiatica.) A. Galambos.
107 Ulceration in the Colon and Rectum. (Ueber Colitis suppurativa und Ulcus chronicum recti.) G. Klemperer and L. Dünner. Commenced in No. 11.
108 *Overstretching and Weakening of the Ligaments and Muscles of the Foot Causing Arch to Fall and Foot to Twist Sideways. (Ueber Heilung des Plattknickfusses.) M. Katzenstein.
109 *Camphor-Phenol in Treatment of Long, Infected Bullet Holes. (Behandlung langer, infizierter Schusskanäle.) E. Mosse.

104. **The Importance of Anaphylaxis for the General Practitioner.**—Friedemann protests against the term "anaphylaxis," saying that Behring's term *Ueberempfindlichkeit*, which may be translated "hypersusceptibility or "oversensitiveness," much better describes the condition. The complete picture of serum sickness includes fever, vomiting, swelling of glands and joints, edema and an exanthem, but it is rare for more than one or two of the symptoms to appear. The usual incubation period is eight to thirteen days unless the individual

has been injected before with the serum, in which case the symptoms may come on almost immediately very severe, amounting to actual collapse in some cases. Only recently a physician was brought to a base hospital in severe serum sickness, as he had given himself prophylactic injections of antitetanus serum, antidysentery serum and diphtheria antitoxin, one after the other.

Man and dogs display far less tendency to anaphylaxis than guinea-pigs. Serotherapy has been applied in thousands of cases in the contagious wards of the great public hospital at Berlin during the last ten years, but only three cases of severe anaphylactic phenomena developed and none of these three patients died. Gaffky was able to find only two authentic cases of fatal serum sickness in Germany during the entire period since serotherapy was introduced, and in one of these two fatal cases the injection was the first the child had received. Statistics are less favorable in America, Friedemann adds, quoting Rosenau and Anderson's (1906) nineteen fatal cases, but they were mostly in those given the serum for the first time. The phenomena of anaphylaxis in guinea-pigs seem also to be severer in America; he quotes that Rosenau and Anderson lost 100 per cent. of their guinea-pigs with induced anaphylaxis while 50 per cent. survived in Otto's experiments in Germany, and only 25 per cent. of the guinea-pigs died in Besredka's experiments in France.

Notwithstanding the mildness, the rarity and the slight danger from serum sickness in man, it is annoying for the patient and worries the physician when it occurs, but all the evidence shows that the tendency to anaphylaxis does not develop before the sixth day. He reiterates that the therapeutic serum can be injected confidently within this interval, and each injection seems to postpone the anaphylactic reaction, so that a patient with epidemic meningitis can be safely given the antiserum through weeks at a time, not letting the intervals extend to six days. Diphtheria antitoxin can be safely administered in the same way. The tendency to anaphylaxis usually dies out more or less completely in six months, but instances are known in which it was still pronounced after five years. The intravenous route is much more liable to induce the phenomena of anaphylaxis than by subcutaneous or intramuscular injection.

The phenomena of antianaphylaxis can also be counted on to ward off serum sickness. Injection of a small amount of the serum induces an antagonistic condition to anaphylaxis, so that a following large injection causes no disturbance. Otto recommends on the basis of his experimental research and clinical experience a preliminary injection of 1 c.c. of the serum four hours before the main injection. This simple procedure is advisable when the patient has asthma or there is other reason to fear an idiosyncrasy even to a first injection. Ascoli's suggestion to use cattle or sheep serum to vary the nature of the serum is not practicable yet. Horse serum is less toxic. During 1913 there were from 5,000 to 6,000 cases of diphtheria in Berlin and the mortality in the hospitals averaged 15 per cent. Braun reported that only 1.62 per cent. contracted diphtheria among the other members of the family given prophylactic injections, while from 30 to 35 per cent. developed it in those not given the prophylactic injections.

105. **Treatment of Cholelithiasis.**—Boas relates that the war with its nervous strain, the changes it has brought about in the financial status, the food and other conditions of living has entailed many ailments not only among the troops but in the civilian population, such as never were encountered on the same extensive scale in times of peace. Chief among them, according to his experience is gallstone trouble. Cholelithiasis affects mostly women, and especially married women, and these are the ones who are hardest hit by the war, worrying for husband and sons, the breaking up of the home, and, connected with this, the neglect of their own health, the high prices of provisions—these and other circumstances combine to prepare the soil for the development of gallstones or fan a latent tendency into a flame. Cholelithiasis, he remarks, may thus be regarded as a war malady. Internal medicine has only a limited field in management of cholelithiasis. To claim otherwise, he continues, is to reveal a childish misconception of the mechanism of gallstone production.

The custom of giving morphin to arrest the attack goes directly counter to Nature's efforts to expel the foreign body. The pain can be relieved in other ways, by hot compresses, hot tea, etc., which reenforce Nature instead of neutralizing her efforts. If a sedative is absolutely necessary, use the smallest doses, and select chloroform, papaverin or codein, explaining to the patient that by abstaining from morphin there is much better chance that the concrement may be expelled and not give cause for future attacks. Perhaps the reason why there are so few "successful attacks" nowadays is because morphin is given so freely.

He has for years derived great benefit from local bloodletting, scarifying the skin in the gallbladder region and keeping up the bleeding with a suction bell. It is easy to draw considerable blood in this way. This is especially useful with acute gallbladder trouble or acute enlargement of the liver. It is astonishing to see the complete subsidence of all disturbances, the day after this bloodletting the patients able to go about their work as usual. He adds that when we consider the mechanical conditions, the assumption that measures to promote the flow of bile will wash away the stones or prevent the formation of new concrements, is as fantastic as the naïve idea that gallstones in the body can be dissolved by chemical agents.

A number of factors are known to help in eliciting gallstone attacks, and avoidance of these factors tends to ward them off. Persons with gallstone trouble almost invariably have a history of habitual constipation and functional disturbance in the stomach, usually achylia gastrica, or there may be hyperchlorhydria or sagging of the stomach and bowels. Undigested or half digested food in the duodenum presses on and obstructs the common bile duct, or offers opportunity for migration of microbes into the bile passages. The fact that the gallstone attack occurs when the digestive tract is overloaded, confirms this assumption. Gallstone attacks never seem to occur with stenosis of the pylorus. The behavior of the stomach must receive more attention than hitherto in management of cholelithiasis. Large meals, especially at night, should be strictly avoided. In short, he regards dietetic measures as the main element in treatment of cholelithiasis, small light meals at intervals of two or three hours, avoiding raw fruit, salads, black bread and pickles. As cholelithiasis is such an essentially chronic affection, treatment must be continued to correspond. Of great value are the various elements of spa treatment, rest, dieting, regular meals, baths and outdoor exercise, besides drinking the mineral waters, but he orders a six or twelve months' stay. This offers the most favorable chances for keeping the gallstone trouble latent.

A stone impacted in the common bile duct is dangerous mainly on account of the cholemia with its depressing influence on the general health and the uncontrollable pruritus. He has never known of an instance of a gallstone being forced out of its nook by medical measures alone. Hence he advocates operative measures here, without wasting time on others. But medical measures are generally effectual in simple catarrhal or purulent gallbladder disease; all that is required is cautious dieting, ice to the liver and small doses of narcotics. When the inflammation in the bile passages or gallbladder is very severe, with fever and chills, the systematic administration of calomel, 0.1 gm. three times a day, kept up at least four weeks, may save the patient an operation. The Russians, who introduced this calomel treatment, give larger doses, up to 0.5 gm. several times a day. Boas has had this treatment fail in a few cases, but as a rule it is effectual. After the chills and fever are arrested by it, he resumes the calomel again if the trouble flares up again. Conditions are more favorable for retrogression when the disease process is in the gallbladder alone. He has never been successful with medical measures in chronic cholecystitis or in the disturbances from adhesion to other organs. Palliative treatment does little good and operative relief is called for, especially when the patient has not the time or means for rest cures, etc. As regards the rare recurrence of

gallstone trouble after an operation, Boas remarks that it is never comparable to the primary trouble, and usually yields to a course of spa treatment. The disturbance may be due to recurrence of stones or to postoperative adhesions.

108. **Treatment of Flatfoot that Bends Over.**—Katzenstein relates that the trouble is primarily in the weak and stretched tibionavicular ligament. The foot bends over and the arch falls in consequence. Treatment should aim to shorten and strengthen the ligament involved, and this is readily accomplished by injection of 0.5 c.c. of a 4 per cent. solution of formaldehyd into each side of the ligament, distributed at several points. This hardens and actually tans the ligament, causing it to shrivel. He has a plaster cast worn for a month and by the end of another month not a trace is left of the flatfoot and knock-ankle disturbances. His only failures have been in cases in which other ligaments were involved. He has never attempted the injection into other ligaments. Local anesthesia is necessary and he gives a little morphin besides.

109. **Camphor-Phenol for Seton Wounds.**—The general rule is to slit the tissues and expose the floor of the seton wound throughout, but Mosse has found that it is possible to avoid these mutilating operations. He draws a strip of gauze through the seton, keeping the gauze wet with a mixture of 100 parts phenol to 200 parts triturated camphor.

Wiener klinische Wochenschrift, Vienna

Dec. 16, 1915, XXVIII, No. 50, pp. 1373-1404

110 Gastro-Intestinal Affections in Army Medical Practice. (Die militärärztliche Konstatierung von Magen- und Darmkrankheiten.) W. Zweig.
111 Pyramidon in Treatment of Erysipelas. (Pyramidon als entzündungsbeschränkendes Mittel bei Erysipel.) H. Januschke.
112 Peritonitis from Rupture of Bile Passages; Two Cases. (Zur Kenntnis der durch Gallengangrupturen bedingten Peritonitis.) F. Ermer.
113 Antibody Production after Vaccination with Various Antityphoid Vaccines. (Immunkörperbildung bei Impfungen mit verschiedenen Typhusimpfstoffen.) M. Gröbl and K. Hever.
114 Improved Technic for Bacteriologic Study of Cholera. (Vergleichende Untersuchungen mit festen Cholera-Elektivnährböden. Ergänzung zur Aronsonschen Methode.) W. Stern.
115 Treatment of Frostbite. (Behandlung der Erfrierungen.) K. Wagner.
116 Living Lice Known to be at least Seven Months Old. (Zur Frage der Lebensdauer der Kleiderlaus.) Wiener.
117 Splint for Fractured Thigh. (Neue Schiene zur volkommenen Fixation von Oberschenkelbrüchen.) E. v. Gergö.

Policlinico, Rome

December, 1915, Surgical Section No. 12, pp. 557-604

118 Fifth Successful Operation on Record for Removal of Primary Tumor in Body of Pancreas. (Contributo alla chirurgia del pancreas.) G. Serafini.
119 Experimental Research on Plastic Repair of Defect in Gallbladder. (Ricerche sperimentali sulla riparazione delle perdite di sostanza della cistifellea mediante innesti liberi di vena, auto- ed omo plastici.) G. Aperlo and C. L. Rusca.
120 Tumors of the Palate. (Sui cosidetti tumori misti del palato.) G. Morone. Commenced in No. 9.
121 Abdominal Wounds in War. (Considerazione sulle ferite d'arma da fuoco dell'abdome.) O. Cignozzi.

Mitteilungen a. d. med. Fakultät der k. Univ. Tokyo

1915, XIV, No. 2, pp. 217-416. Last indexed Oct. 30, 1915, p. 1593

122 *Septic Jaundice. (Ueber die Pathogenese des septischen Ikterus.) T. Ogata and T. Mitamura.
123 *Catarrhal Jaundice. (Zur Pathogenese des Icterus catarrhalis.) T. Mitamura.
124 *Thymus Transplantation. (Recherches expérimentales sur la transplantation du thymus. I.) Y. Tongu.
125 *Bone Marrow Transplantation. (Ueber Transplantation von Knochenmark.) Y. Tongu.
126 Phenomena Suggesting Secretion in the Epidermic Cells of Amphibia Larvae. (Ueber Sekretionserscheinungen an den Epidermiszellen von Amphibienlarven.) S. Saguchi. Colored Plates.
127 Physiologic Degeneration of Cells. S. Saguchi. Colored Plates.

122. **Pathogenesis of Septic Jaundice.**—The necropsy findings in four typical cases of septic jaundice all showed degenerative changes in the parenchyma of the liver and deficiency of bile. Hence stagnation of bile could not be incriminated. The bile capillaries were not distended. Oligocholia and oligochromia were pronounced in each case; this important element in the picture of septic icterus seems to have escaped attention hitherto. They are signs that the liver cells are not working properly. This was evidenced further by the albumin found in the scanty bile present. The germs cultivated from the four cases were the *Streptococcus longus*, the *Staphylococcus albus* and the *Diplococcus lanceolatus*. The patients were three women of 21, 26, and 34, with the clinical diagnosis of puerperal fever, and one man of 34 who had succumbed to meningitis of otitic origin.

123. **Catarrhal Jaundice.**—Mitamura reports the case of a previously healthy man of 24 who died nine days after the stormy onset of catarrhal jaundice with high fever, pronounced icterus and delirium. Necropsy confirmed the assumed gastro-intestinal catarrhal condition with mechanical obstruction to the outflow of bile at the mouth of the common bile duct. The spleen was not enlarged, and he knows of no case of Weil's disease in which a mechanical hindrance to the outflow of bile, from catarrhal conditions in the duodenum, was discovered at necropsy. The microscopic findings in the liver are reproduced.

124. **Transplantation of the Thymus.**—Tongu describes the work in this line done by Scalon (1900), Basch, Bircher (1912) and others on rabbits and dogs, and then reports the details and results of his own experiments. He used about twenty dogs and fifty rabbits, but many of the animals died at once or soon after the operation, either from infection or weakness. The transplanted thymus in these animals had either been absorbed or had decayed, especially in the center. In only three dogs and eight rabbits were the results conclusive. They demonstrated apparently that the most favorable location for autoplastic transplantation of thymus tissue is the peritoneal cavity. Implants in the spleen, under the skin or peritoneum, and between the abdominal muscles were resorbed more rapidly. The thymus tissue never showed signs of regeneration but displayed a tendency to atrophy. In some of the animals it persisted as long as two months, in the mesentery region, showing merely slight atrophy, as is evident from the view given of the microscopic findings in one such case.

125. **Transplantation of Bone Marrow.**—The same writer reports similar research on seven dogs and ten rabbits with autoplastic transplantation of bone marrow. The osteoblasts proved most active when an emulsion of periosteum had been injected or transplanted. They were less active when a segment of bone marrow was transplanted, and least active after injection or transplantation of an emulsion of bone marrow. The newly formed bone tissue resulting from the transplantation of periosteum and bone marrow was gradually destroyed by the osteoclasts, disappearing completely in time. Tongu describes the research of others with transplantation of bone marrow and discusses the various questions raised by his experience.

Russkiy Vrach, Petrograd

1915, XIV, No. 45, pp. 1057-1080

128 *The Various Stages of the Action of Poisons on Tissues. (O dieistvii yadov v razlichnie periodi prebivaniya ikh v tkanyakh.) N. P. Kravkoff.
129 Symptomatology and Treatment of Asphyxiation with Poisonous Gases. G. A. Kolossoff.
130 *Bacteriology of Gangrene. (Izsliedovanie po bakteriologie gangrenoznikh protzessov.) I. I. Shukevich.

No. 46, pp. 1081-1104

131 The Purposes of Russian Sanatoria Society. V. N. Sirotinin.
132 *The Cause of Favorable Action of Cod Liver Oil in Spasmophilia. (Otchego zavisit blagopriyatnoe diestvie ribyago zhira pri spasmophilii?) I. A. Shabad.
133 Colostomy in Gunshot Wounds of the Rectum. A. G. Machavariani.
134 *Poisoning with Denatured and Wood Alcohol in Kazan Hospitals. (Otravlenie drevesnim i denaturirovannim spirtom . . . v Kazani za 1914 g.) I. S. Krivonossoff.
135 Mental Derangement from Mushroom Poisoning: Agaricus Muscarius. T. H. Bielugin.
136 A Case of Diaphragmatic Hernia. G. A. Sokoloff.

128. **Stages of Action of Poisons on the Tissues.**—Kravkoff distinguishes the stage of invasion, the stage of saturation of the tissues with any given poison, and the stage of elimination. These three stages he studied on the isolated heart

and ear vessels of rabbits, by means of Ringer's or Locke's fluid. First he determined the action on these organs of a normal fluid, after which the latter was passed with various poisons dissolved in it, paying especial attention to the stage of saturation, when the tissues retain the poison for a certain period. He also determined the simultaneous action of poisons such as morphin combined with nicotin, hedonal and nicotin, etc. The results obtained demonstrate that when the tissues are saturated with a poison of a certain concentration they become less sensitive to the same poison, even in a stronger concentration. Especially is this true of nicotin. The tissues saturated with a poison become less sensitive not only to the same poison, but also to other poisons of the same or other pharmacologic groups. Thus, when saturated with hedonal, they react less to chloroform; in the case of nicotin, they are less sensitive to pilocarpin; in the presence of morphin they become less sensitive to nicotin, etc. Simultaneous combination of two poisons—outside of the stage of saturation with one of them—causes phenomena of combined action, the clinical picture of one of them predominating. Thus, the simultaneous action of chloroform and nicotin gives the typical action of nicotin. The simultaneous presence of one poison in the tissues and their saturation with it modifies essentially the physiologic action of another poison, giving results different from those obtained by the simultaneous action of the two poisons.

130. **Bacteriology of Gangrene.**—Shukevich examined eighteen cases of various gangrenous processes and found polymicrobic infection in all, though Welch's bacillus was apparently the most frequent cause of gaseous gangrene. In putrid wounds, not complicated with gaseous gangrene, Welch's bacillus also occurred very frequently, hence the latter does not always lead to formation of gaseous gangrene. The putrid character of the wounds may be due to infection with *Bacillus sporogenes A* and *Bacillus proteus vulgaris*.

132. **Limitations of Efficacy of Cod Liver Oil in Spasmophilia.**—Shabad found from his clinical observations that the favorable action on spasmophilia of cod liver oil or of the phosphorus contained in it is by no means specific, because it is inconstant. It is apparent only when there is a combination of spasmophilia with florid rickets, and is of no value in other cases. The action of cod liver oil on spasmophilia is most probably due to the better assimilation of lime salts. In rickets, therefore, where assimilation of lime is below normal, cod liver oil or phosphorus is of value. However, in cases in which the assimilation of lime is above normal, as during recovery from rickets, or in spasmophilia unaccompanied by rickets, cod liver oil cannot have any favorable effect on the symptoms of spasmophilia.

134. **Intoxication from Substitutes for Alcohol.**—During 1914, in two of the large hospitals of Kazan, 1,052 cases of alcoholism were registered. In 23 per cent., that is, 240 cases, the poisoning was due to denatured alcohol, varnish or Cologne water. All kinds of trades and ages (below 10 and up to 70) were represented and are listed in the tables given. About 50 per cent. of these patients were between 20 and 30. Laboring men and artisans were the usual victims. Of 45 ward patients, 30 died, of whom 19 succumbed during the first twelve days; 8 died on the second day and 3 on the third. Of 10 patients treated in another hospital, 8 died, 5 of whom died during the first twenty-four hours following the poisoning. The majority of the patients were brought to the hospital in a comatose state. The amounts ranged from one-fourth glassful of denatured alcohol to three bottles of Cologne water. Though cases of chronic alcoholism from liquor are now rare, yet poisoning with other kinds of alcohol, such as wood alcohol, etc., are becoming quite frequent. Hence Krivonossoff pleads to have the retail uncontrolled sale of substitutes for liquor forbidden by law.

Finska Läkaresällskapets Handlingar, Helsingfors

1915, LVII, No. 4, pp. 373-502

137 *Syphilis Affecting the Central Nervous System. J. Hagelstam.
138 Menstruation in Finland. E. Waren.
139 *Pylorospasm in Young Infants. (Behandlingen of pylorospasm hos spädbarn.) E. Lövegren; (Om pylorospasmus hos dibarn.) W. Pipping.

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140 The Blood Picture in Children with Bothriocephalus. (Om blodbilden hos botriocefalusbärare.) G. Becker.
141 Extension Treatment of Gunshot or Shell Wound of Lower Jaw. (Til behandlingen af skottfrakturer i nedre käken med extensionsförband.) R. Faltin.
142 Infection of the Eye from Vaccination Pustule. (Om Vaccineruptioner i ögat.) E. Kuhlefelt.

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143 Treatment of Spontaneous Pneumothorax without Complications. T. W. Tallqvist.
144 Anatomy of Spondylolisthetic Pelvis. (Spondylolistetiskt bäcken, beskrifvet anatomiskt.) O. Engström.
145 Study of Tuberculosis in Island District. (Tuberkulös infektion och tuberkulös sjukdom bland befolkningen i en österbottnisk kustsocken.) K. v. Kraemer.
146 Myomas Preventing Delivery; Two Cases. (Till förlossningsterapien vid uterusmyom.) T. Länsimäki.

137. **Syphilis Affecting the Nervous System.**—Hagelstam reviews his experiences with 50 cases of tabes, 7 of syphilitic myelomeningitis, 93 of cerebrospinal syphilis and 13 of paralytic dementia. He made a special study of the reactions of the cerebrospinal fluid and tabulates the findings in a later series of 34 cases. Treatment was with mercurial inunctions and potassium iodid. Only within the last few years was salvarsan added. One fatality under salvarsan was observed, an undiagnosed tumor (gumma?) in the frontal lobe having undergone rapid hemorrhagic degeneration under the influence of the salvarsan with fatal results. The symptoms in this man of 30 had suggested beginning tabes with some intercurrent febrile infection, possibly influenza. As a supplement to the usual mercurial treatment he was given an infusion of 0.45 gm. neosalvarsan and six days later another. He seemed to be entirely restored but two days later died in a sudden convulsion, explained by the blood found in the frontal lobe in the débris of a tumor as large as a hen's egg.

139. **Pylorospasm in Infants.**—Lövegren reports two cases and Pipping six. Lövegren's two cases were in boys and the spasm developed during the fifth week. One child was kept at the breast, watching to see that no more milk was taken at a time than the stomach could bear. The other child was fed with breast milk drawn artificially and given both by the mouth and rectum. The advantages of the 25 or 30 c.c. of breast milk instilled into the rectum six times a day were plainly obvious. The child was also given 5 gm. of veal bouillon before each meal. Under these conservative measures alone the children did not lose much in weight and by the third month were thriving normally. The fatal one in Pipping's six cases was the only girl. The spasm came on either immediately after birth, the third or fourth day, or the second, third or fourth week. In one case the spasm began with melena and in two cases there was bile in the vomit. One of the children lost 35 per cent. of his weight. Only one of the children was given breast milk alone. The aim was to give the food in small amounts and with as little fluid as possible. On the whole his experience speaks in favor of internal treatment alone.

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147 Basophil Stippling of Red Blood Corpuscles in Various Forms of Anemia. (Basofil Punktering af de røde Blodlegemer ved forskellige Former af Anæmi.) V. F. Møller. Commenced in No. 50.
148 *Tests of the Cerebrospinal Fluid in Syphilis. (Undersøgelse over Lymphocytose, Hyperalbuminose og Wassermann's Reaktion i Cerebrospinalvædsken ved Syphilis.) C. With. Commenced in No. 49.

148. **Tests of the Cerebrospinal Fluid in Syphilis.**—The details are tabulated here from 144 cases of syphilis in its various phases, progressive paralysis and "nerve syphilis." They show that the cerebrospinal fluid may present the Wassermann reaction, increased albumin content or lymphocytosis at any stage of syphilis. These abnormal findings in the cerebrospinal fluid are particularly frequent and pronounced with untreated leukoderma. With never found the cell content increased in cases of simple tumors in the central nervous system, but the albumin content was often high. The preceding instalments were summarized in these columns January 29, p. 392.